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~~This~~ The Report to the President and Congress is EPA's first annual report on its activities under RCRA and it summarizes in detail the programs for FY 1977 and outlines solid waste problems, program objectives, legislative considerations, and plans for FY 1978.

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

FEB 1 1978

THE ADMINISTRATOR

To the President and to the Congress of the United States:

I am submitting herewith the Environmental Protection Agency's first annual report on its activities under the Resource Conservation and Recovery Act of 1976 (RCRA), Public Law 94-580. As required in Section 2005, this report summarizes in detail the programs for Fiscal Year 1977 and outlines solid waste problems, program objectives, legislative considerations, and plans for Fiscal Year 1978.

Respectfully,

Douglas M. Costle

Enclosure

PB88-197603

PREPUBLICATION COPY

EPA
ACTIVITIES UNDER THE RESOURCE CONSERVATION AND RECOVERY ACT OF 1976

Annual Report to the President and the Congress
Fiscal Year 1977

This report (SW-663) was compiled
by the Office of Solid Waste as required by Section 2005
of the Solid Waste Disposal Act as amended by the
Resource Conservation and Recovery Act of 1976
(Public Law 94-580) and was delivered February 1, 1978,
to the President and the Congress

U.S. ENVIRONMENTAL PROTECTION AGENCY 1978

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ATTENTION

AS NOTED IN THE NTIS ANNOUNCEMENT, PORTIONS OF THIS REPORT ARE NOT LEGIBLE. HOWEVER, IT IS THE BEST REPRODUCTION AVAILABLE FROM THE COPY SENT TO NTIS.

Chapter 1

Overview and Summary

The 1976 amendments to the Solid Waste Disposal Act, titled the Resource Conservation and Recovery Act of 1976 (RCRA), mandate national action for the first time against solid waste management practices that lead to environmental and public health hazards. They also seek to promote resource recovery and conservation as waste management options. The main provisions of RCRA for achieving these goals are as follows:

- Federal financial and technical assistance to State and local governments is authorized for planning and development of comprehensive solid waste management programs that include environmental controls on all land disposal of solid wastes, regulation of hazardous wastes from point of generation through disposal, and resource recovery and conservation activities.
- Such State programs would include schedules for upgrading or closing all environmentally unacceptable land disposal sites ("open dumps") identified according to EPA criteria and a nationwide inventory. Open dumping is prohibited except as covered by an acceptable schedule for compliance under the State plan.
- Where States do not establish hazardous waste regulatory programs that meet Federal standards, EPA will administer regulatory control.
- A Cabinet-level interagency study of resource conservation policies is mandated; findings and recommendations are to be submitted periodically to the President and the Congress.
- Public participation is required in the development of all regulations, guidelines, and programs under the Act.
- Research, demonstrations, studies, and information activities related to a wide range of solid waste problems are authorized.

This report, prepared as required under Section 2005 of the law, describes the activities of the U.S. Environmental Protection Agency during fiscal year 1977 in carrying out the mandates and authorizations of RCRA. Following this overview and summary, the activities related to State and local program development, the land disposal provisions, hazardous waste regulation, resource recovery and waste reduction, and public participation and information are covered in greater detail (Chapters 2-6). Brief reports from the EPA Regional Offices have been compiled in Chapter 7 to give a better indication of how implementation of RCRA is being carried out in the Regions. Finally, a list of reports and publications issued during the year is appended.

SOLID WASTE PROBLEMS

RCRA represents a response to the problems of solid waste as described in Section 1002. Data that have become available in the year since October 1976 further substantiate and, in some cases, intensify previous characterizations of solid waste problems.

Growth in Waste Generation

On the basis of surveys of 14 industry groups, EPA estimates that industrial wastes generated in 1977 totaled about 344 million metric tons. About 10 percent of this may fall in the "hazardous waste" category—wastes requiring special safeguards in handling and disposal because of the substantial danger they pose to health and the environment. Industrial waste generation is growing at a rate of about 3 percent per year. An increasing percentage of the waste is resulting from pollution control processes. Thus the more stringent controls on discharge of pollutants to the air and water constitute a prime source of the overall increase in these wastes to be disposed of on land.

The generation of municipal solid waste (residential and commercial refuse) is also increasing. It is estimated that around 130 million metric tons of such waste were generated in 1976. The projected figure for 1985 is 180 million metric tons, based on present trends and policies.

Another category of waste, municipal wastewater treatment sludge, is currently being generated at the rate of roughly 5 million tons (dry weight) per year by the nation's 18,000 municipal wastewater treatment plants. This amount will probably double in the next 8 or 10 years as communities upgrade wastewater treatment to meet pollution control standards.

In addition, billions of tons of mining and agricultural wastes are disposed of on the land each year.

Environmental Effects

Hazardous Wastes. EPA now has on file over 400 case studies of damages—acute or chronic injuries to health, environmental pollution, and economic losses—resulting from improper hazardous waste management. It is clear from the haphazard way in which most of these incidents have come to light that the majority of such incidents have gone unreported. The damages observed to result from land disposal of hazardous wastes have occurred through six major routes: ground water contamination via leachate; surface water contamination via runoff; air pollution via open burning, evaporation, sublimation, and wind erosion; poisoning via direct contact; poisoning via the food chain; and fire and explosions.

Of the damage incidents related to hazardous waste disposal that have been documented by EPA, the majority relate to ground-water contamination. An EPA study to investigate the presence of ground-water contamination resulting from subsurface migration of hazardous constituents of land-disposed industrial wastes was completed in 1977. Of the 50 sites sampled, 43 showed migration of heavy metals and/or organic chemicals into ground water.

It is estimated that up to 90 percent of industrial hazardous waste is being disposed of by the same methods that have produced the damages documented to date. There can be no doubt that controls such as those required by RCRA are needed to assure that generators, transporters, disposers, and others involved in the management of hazardous wastes take the precautions necessary to protect public health and the environment.

Other Wastes. Indiscriminate disposal on land of virtually any type of waste can lead to environmental damages; water pollution from leachate or surface runoff is the prime concern. The extent of the ground-water contamination problem was made clear by findings of the EPA survey and study carried out pursuant to Section 1442 (a)(4) of the Safe Drinking Water Act and reported to Congress in January 1977. The study found that "Waste disposal practices have contaminated ground water on a local basis in all parts of the nation and on a regional basis in many heavily populated and industrialized areas .... Nationally, the principal sources of ground water contamination related to waste disposal practices are industrial wastewater impoundments and solid waste land disposal sites."

The importance of protecting ground water quality is indicated by other statements in the report: "Half of the population of the United States is served by ground water .... The use of ground water is increasing at a rate of 25 percent per decade .... Removing the source of contamination does not clean up the aquifer once contaminated. The contamination of an aquifer can rule out its usefulness as a drinking water source for decades and possibly centuries."

Environmental hazards of improper land disposal of municipal solid waste also include the lateral migration and concentration to dangerous levels of methane from landfills, the breeding of disease vectors, and air pollution from open burning. Often of major concern to local residents are the nuisance factors of poorly managed sites—the general appearance, the litter, odors, traffic congestion.

Although no precise data exist on the current disposition of municipal sludge, it is estimated that roughly half is being landfilled or spread on land surfaces, with the rest being incinerated or disposed of in the ocean. The improper landfilling of municipal sludge can result in the degradation of ground and surface waters with heavy metals, toxic organics, pathogens, and nitrates. Without adequate controls, surface land application, particularly on agricultural lands, may pose a threat to public health, crop growth, and wildlife due to the effects of heavy metals, pathogens, and toxic organics.

The task of upgrading land disposal practices is immense—it has been estimated that there are approximately 20,000 general refuse sites, 23,000 sludge disposal sites, and 50,000 surface impoundments for industrial waste. In addition, there are many thousands of industrial dumps and landfills, mining waste piles, and other types of disposal sites. Most States have permit systems only for municipal solid waste disposal sites; around 20 percent of such sites meet existing State requirements.

Siting of Disposal Facilities

It is apparent from the experiences of communities across the nation that most people prefer to have waste disposal or processing facilities located some place other than their part of town, or perhaps, as in the case of hazardous waste facilities, some part of the country other than their own State. This aversion is based in part on the record of undesirable disposal practices ranging from those that merely offend the eye to those that severely threaten public health through toxic and persistent chemicals.

Disposal sites have typically been located in places considered not valuable for other purposes. Many such places—marshes and ravines, for example—are likely to become a source of water pollution when used for waste disposal and therefore will not be considered environmentally acceptable under the criteria to be established under RCRA. While in one sense the law thus adds to the siting problem by imposing new restrictions, it should also assure environmentally safe and acceptable practices and thereby provide the basis for a positive public view of disposal facilities as nonthreatening and necessary services. This is a goal which must be worked toward through the clear demonstration of sound planning and practices, through public education, and through public participation in State and local decision-making. Meanwhile, siting will continue to be a very difficult task in many areas. Some of the special exigencies with regard to siting of hazardous waste treatment and disposal facilities are noted in Chapter 4.

Municipal Collection and Disposal Costs

The direct costs to local governments of collection and disposal of municipal solid waste alone exceed $4 billion a year. The average cost per ton is estimated at approximately $30. Collection costs account for around three-quarters of this, but in many urban areas disposal costs are also high because nearby disposal sites are being used up, new sites are difficult to establish, and expensive long hauls to distant sites are common. It is expected that the upgrading of land disposal practices to a level that is environmentally acceptable will add considerably to disposal costs for many communities. This may constrain the upgrading process, but it will also provide an added incentive for undertaking resource recovery.

Levels of Resource Recovery and Waste Reduction

Reducing waste generation and increasing the recovery of resources would lessen the problems associated with waste disposal and the adverse environmental effects which accompany the entire cycle of material production and use, as well as conserve energy and materials. However, national attitudes, habits, and policies based on high consumption of virgin resources have been inimical to the development of resource conservation measures, particularly as they apply to the post-consumer waste stream. As a result we have a high rate of municipal solid waste generation (about 1,300 pounds per person per year) and a low rate of resource recovery (about 6 percent of municipal solid waste). It has been estimated that through source separation methods alone the amount recovered could be tripled.

EPA's *Fourth Report to Congress on Resource Recovery and Waste Reduction* (August 1977) described the explicit and implicit public policies and shortcomings in our market pricing system that bias the system in favor of virgin materials and against secondary materials. These include Federal policies stimulating natural resource development; historical disregard for environmental degradation, leading to failure to reflect the full social costs of production in prices of materials and fuels; institutional factors that typically obscure and understate the costs of waste collection and disposal; and Federal policies that may adversely affect resource recovery, such as prejudicial labeling for secondary materials and freight rates that may favor virgin materials.

As noted above, the provisions in RCRA to end the cheap disposal options that ignore environmental costs help to right one of the imbalances that handicap the growth of resource recovery. The interagency Resource Conservation Committee's mandate to study and make recommendations regarding present and proposed policies affecting resource conservation (Section 8002 (j)) is another step that could lead to major improvements in economic conditions for resource recovery and waste reduction.

The cause of resource recovery could be furthered also by improvement in the methods and technology for recovery that are now available to communities. Increased Federal efforts are necessary to bring about the full development of a range of effective options from which communities can select those that fit their markets, waste volumes, finances, and other circumstances.

Other Problems Affecting Implementation of RCRA

Obviously all of the above problems affect RCRA implementation. The siting of processing and disposal facilities, particularly, is a crucial matter for hazardous waste regulation and the States' efforts to upgrade land disposal. There are in addition several problems that are related more specifically to implementation activities. These include: the needs of States for resources to implement programs for hazardous waste regulation, upgrading of land disposal, and resource conservation; the specific areas, such as toxicity testing of hazardous waste, where knowledge is lacking and must be developed in order to fully support the regulatory and technical assistance program; and the magnitude of the task of evaluating all land disposal sites and what this implies in terms of time and resources required. Such problems, which are more readily perceived in relation to a discussion of the programs, are described as part of the following chapters.

ACTIVITIES

Planning and Development of State and Local Programs

RCRA mandates actions by EPA to assist in the planning and development of comprehensive State and local programs. Such programs would include hazardous waste regulation, environmental controls on all land disposal, and resource recovery and conservation. Overall objectives for the fiscal year with regard to State and local planning and development were to (1) promulgate guidelines for identification of regions and agencies for solid waste management as required under Section 4002 (a); (2) begin preparing the guidelines for State solid waste planning and implementation as required under Section 4002 (b); (3) deliver technical assistance to State and local governments in all areas of solid waste management and organize a program for technical assistance panels that will operate from the Regional Offices (Section 2003); and (4) prepare a program of Federal financial support to State and local governments (Sections 3011 and 4007).

The guidelines for identification of regions and agencies for solid waste management were published in interim form on May 16, 1977. The EPA Regional Offices, with support from headquarters, are assisting the States and local officials to implement these guidelines. The guidelines for State plans are now under development. They will incorporate the minimum requirements set forth in Section 4003, including the prohibition of new open dumps and provisions for the closing or upgrading of all existing open dumps.

The program of Resource Conservation and Recovery Panels required under Section 2003 to provide technical assistance to State and local governments will begin in fiscal year 1978. It will be managed by the Regional Offices with headquarters support and coordination. State and local governments will have available to them panels of personnel headed by EPA technical specialists and including consultants and officials of other State and local governments. Assistance will be available for all areas of solid waste management, including land disposal, hazardous waste management, and resource recovery, with emphasis on the major tasks and problems in the fulfillment of RCRA objectives.

The planning aids in solid waste management recently developed by EPA include WRAP (Waste Resources Allocation Program), a modeling tool for regional solid waste management planning.

Federal financial assistance for State solid waste management programs totaled $3 million in fiscal year 1977; in fiscal 1978, such aid will total $14.3 million.

Plans for 1978 in assisting State and local program planning and development include: promulgation of the guidelines for State plans; completion of the process of identifying regions and agencies for solid waste management; establishment of the program of technical assistance panels; a study of manpower and training needs; and, pending availability of funds, preparation of a grant program to assist rural communities (Section 4009).

Land Disposal

Several requirements are set forth in the Act with the aim of eliminating environmentally unacceptable land disposal practices through the State solid waste programs. EPA objectives for the fiscal year in this area were to (1) develop criteria for the classification of land disposal sites as environmentally acceptable or not acceptable (Section 4004); (2) plan for the inventory of land disposal sites (Section 4005); (3) continue development of overall EPA policy on municipal and industrial sludge management; (4) provide technical assistance to State and local governments; (5) continue development of the data base for economical and environmentally safe processing and disposal of solid waste; and (6) undertake the required studies on solid waste cleanup in Alaska, management of mining wastes, and sludge management.

The criteria for classification of solid waste disposal sites are crucial, since they will be the standards for judging whether a site is environmentally acceptable or is unacceptable and must be closed or upgraded. In developing the criteria special efforts are being made to obtain and respond to input from all interested sectors of the public and levels of government. Because of the difficulties in setting such criteria for the nation and the need to confer extensively within and outside the agency, promulgation will be delayed until the summer of 1978.

Plans are being laid for the inventory of open dumps, which EPA is required to publish within 1 year of the issuance of the criteria. To prepare a complete inventory, over 100,000 sites will have to be evaluated. This will take longer than 1 year, and a phased inventory seems to be the feasible approach to the task. Bureau of the Census is assisting on planning the inventory. The States will inspect and evaluate the sites with EPA financial and technical assistance.

As part of the overall EPA effort to formulate policy on municipal and industrial sludge, a municipal sludge strategy paper is under preparation; it will be made available for public comment in early 1978. A decision guide for local officials on municipal sludge management is also being prepared.

The Office of Solid Waste has been studying the experiences of communities in attempting to establish new land disposal sites in order to share the observations with other communities. An example of successful siting in California was described in a report published in 1977.

The required studies on solid waste cleanup in Alaska, mining wastes, and residual sludges are in progress. In addition there is a wide range of ongoing studies and demonstration projects being conducted by the Office of Research and Development and the Office of Solid Waste. Some major subject areas are: waste characteristics, pollutant transport following land disposal, pollutant control and treatment, codisposal of different types of wastes, remedial action at inoperative disposal sites found to be environmentally unsound, and land application of municipal sludge.

Plans for fiscal year 1978 include: promulgation of the land disposal criteria; initiation of the inventory process; development of guidelines on land disposal pursuant to Section 1008; a program to develop a data base on industrial disposal facilities; completion of the required studies on solid waste cleanup in Alaska, sludge, and mining wastes; and continuation of other research and demonstration activities.

Hazardous Waste Management

EPA activities relating to hazardous waste management were directed toward the following objectives in fiscal year 1977: (1) development of the standards, regulations, and systems required under Subtitle C; (2) encouragement of State implementation of authorized regulatory programs and development of guidelines for such programs; (3) technical assistance to governments, industries, etc.; (4) development of the technical and economic data base for the regulations and for technical assistance; (5) facilitation of expansion of the hazardous waste management service industry; and (6) promotion of resource conservation and recovery.

Development of the regulations, systems, and guidelines is progressing; issuance of the regulations will be delayed past the 18-month period specified in the Act (see table).

How many States will seek EPA authorization to implement their own programs will not be clearly indicated until 1978. A number of them have begun developing programs which may be sufficient for authorization by 1978. The adequacy of Federal funds available to support these programs will be a major factor in the level of State implementation.

EPA's Office of Enforcement is developing policy and procedures regarding the monitoring of hazardous waste management facilities for compliance with Subtitle C regulations. A task force has been established to assist in formulating criteria for compliance monitoring and the procedures for initiating enforcement actions.

The data base for the program is being developed through assessment of damage resulting from improper hazardous waste management; evaluation of various waste management alternatives for adequacy in detoxifying the wastes, immobilizing hazardous constituents, or promoting resource recovery; and analysis of the costs of improper waste disposal and of proper techniques to determine economic impacts.

During the year thousands of requests for technical assistance on hazardous waste management were filled by the headquarters staff and the Regional Offices. Ten workshops were held around the country for State and local officials on sources of technical information. Preparation of the *State Decision-Makers Guide for Hazardous Waste Management* was completed.

For fiscal year 1978, completion of the development of the standards, regulations, and guidelines is foremost on the agenda. Data base development and technical assistance activities will continue. A number of new projects to support implementation of the regulatory program will be undertaken.

Resource Recovery and Waste Reduction

The integration of resource recovery and conservation into the State and local solid waste programs is a major objective of RCRA. In addition a number of activities authorized under the Act are directed toward stimulating development of the field of resource recovery and conservation—the policies, program options, opportunities, methods, and technologies. The objectives for fiscal year 1977 with regard to these latter activities were: (1) implementation at Federal facilities of guidelines, issued in 1976, for source separation, for beverage container deposits, and for resource recovery facilities; (2) preparation of guidelines for Federal procurement of products made from recycled materials (Section 6002); (3) technical assistance in implementing resource recovery systems; (4) development of knowledge and technology through research, demonstrations, and studies; and (5) organizing of the interagency Resource Conservation Committee, submission of the Committee's work program to the President and Congress, and implementation of this program (Section 8002).

The Guidelines for Beverage Containers require that a refundable 5-cent deposit be placed on all containers for beer and soft drinks sold at Federal facilities to encourage the return of the

RCRA REGULATIONS AND GUIDELINES ISSUED OR IN PREPARATION (AS OF JANUARY 17, 1978)

Section of the Act	Description	Statutory deadline	Schedule for issuance*
1008	Solid waste management guidelines	October 1977 and time to time thereafter	The first guidelines will be on land disposal practices; present plan is to issue these in 1978 after the land disposal criteria are determined (Section 4004)
3001	Identification and listing of hazardous waste	April 1978	Publication in proposed form planned for March 1978. Proposed test protocol for toxic wastes will be published separately in June 1978.†
3002	Standards for generators of hazardous waste	April 1978	Publication in proposed form planned for March 1978.†
3003	Standards for transporters of hazardous waste	April 1978	Publication in proposed form planned for February 1978.†
3004	Standards for owners and operators of hazardous waste treatment, storage, and disposal facilities	April 1978	Publication in proposed form planned for April 1978.†
3005	Permits for treatment, storage, or disposal of hazardous waste	April 1978	Publication in proposed form planned for April 1978.†
3006	Guidelines for development of State hazardous waste programs	April 1978	Publication in proposed form planned for January 1978; final in May 1978.
3010	Notification system regulations	–	Publication in proposed form planned for February 1978; final in June 1978.
4002(a)	Guidelines for identification of regions and agencies for solid waste management	April 1977	Interim guidelines published May 16, 1977.
4002(b)	Guidelines for State plans	April 1978	Publication in proposed form planned for March 1978, with final guidelines in June 1978.
4004	Criteria for classification of disposal facilities	October 1977	Publication in proposed form planned for January 1978, with final regulations about August 1978.
6002	Guidelines for procurement practices	–	Publication in proposed form planned for October 1978, with final guidelines in January 1979.
7002	Prior notice of citizen suits	–	Proposed regulations published July 20, 1977; final regulations published October 21, 1977.
7004	Public participation guidelines	–	Interim guidelines published January 12, 1978.
‡	Interim regulations to implement the Resource Conservation and Recovery Act of 1967; Grants and other financial assistance	–	Interim regulations published October 20, 1977.

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*Schedules for issuance of guidelines and regulations that are in preparation are subject to considerable change.

†Publication in final form of regulations under Sections 3001-3005 will take place at one time, since they must be consistent and coordinated with each other. Such publication will take place 3-5 months following publication of all the proposed rules under these Sections.

‡Financial assistance provisions.

containers for refilling or recycling. A test of the guidelines was successfully conducted in 1976 at Yosemite National Park. The Department of Defense is testing the guidelines at 10 military bases. In July 1977 the National Park Service began implementing the guidelines.

The Guidelines for Source Separation for Materials Recovery mandate the recovery of high-grade paper, newsprint, and corrugated boxes from designated Federal facilities. Prototype systems are being started in major Federal buildings in each Region and selected military bases.

The Guidelines on Resource Recovery Facilities require Federal agencies to establish or use resource recovery plants if they are involved in the disposal of solid waste to the degree described in the guidelines. The agencies are encouraged to enter into joint resource recovery ventures among themselves and with nearby communities to maximize economies of scale. The guidelines are thus intended to stimulate regional planning. The majority of facilities affected are Department of Defense installations.

Under Section 6002 of RCRA, Federal procuring agencies are required to procure items composed of the highest percentage of recovered materials practicable. EPA is charged with preparing guidelines to assist agencies in complying with this provision. Meetings are being held with the agencies, manufacturers, and other members of the public to obtain information and opinions relevant to these guidelines.

Intensive technical assistance was provided during the year to 30 communities who are considering or planning and implementing resource recovery systems. To provide local officials and others an opportunity to review and discuss resource recovery technology implementation, a 2-day seminar was presented in five cities to over 800 people. Also, a series of eight *Resource Recovery Plant Implementation Guides* for municipal officials was completed and widely distributed.

Several major resource recovery technology demonstrations supported by EPA are in progress: the pyrolysis projects in Baltimore and San Diego, a project in Delaware to use refuse-derived fuel as a supplemental fuel in oil-fired powerplant boilers, and a project to recover methane from a landfill in Mountain View, California. Detailed evaluations are also being conducted of other systems. Multimaterial source separation is being demonstrated with EPA assistance in two Massachusetts communities with positive results during a year and a half of operation. The Office of Research and Development is conducting a number of projects to develop new recovery processes, optimize existing processes, and find new uses for recovered materials. ORD has also contracted for the studies required by RCRA on composition of the waste stream, priorities in research, source separation and other small-scale systems, and compatibility of source separation with mixed-waste processing systems.

The interagency Resource Conservation Committee submitted its first report, which was a plan for implementing the Committee's mandate, to the President and the Congress on June 9, 1977. The program has been accelerated at the President's request so that the Committee will now make recommendations regarding the solid waste disposal charge concept in early 1978; a report on beverage container deposit legislation is also in preparation.

An interagency agreement is being drawn up between the Department of Commerce and EPA on implementation of RCRA since cooperative action between the two agencies is required under several provisions of the Act.

In fiscal year 1978, EPA activities in resource recovery and waste reduction will include: continued monitoring of and assistance in Federal implementation of the beverage container, source separation, and resource recovery guidelines; preparation of the procurement guidelines; technical assistance activities; completion of the required studies on composition of the waste stream, research priorities, small-scale and low-technology systems; startup of other required studies on glass and plastics, tires, and resource recovery facilities; new projects to evaluate operating resource recovery systems; continued monitoring of demonstrations and studies in progress; and completion of the study program of the Resource Conservation Committee, with interim reports in the spring and fall of 1978.

Public Participation and Information Activities

In accordance with the requirements of Sections 7004 and 8003 for public participation and information activities, the main objectives in 1977 were to (1) inform the public of the provisions of RCRA and their implications; (2) quickly provide opportunities for public participation in implementation of the Act; (3) develop the guidelines for public participation; and (4) continue the programs in preparation and distribution of information materials, citizen education grants, and literature search and library services.

EPA developed a variety of information materials about the Act—summaries, news releases, TV-radio public service announcements, fact sheets, reprints of speeches. The printed materials were widely distributed and provided in bulk to States and local governments who requested such material for distribution.

The public participation program began in December 1976 with public meetings in Washington, D.C., and all the Regions to discuss RCRA and its implications. Subsequent meetings, hearings, and workshops were scheduled in accordance with the development of the Act's key provisions. By the end of the fiscal year, approximately 100 meetings had been held across the country to obtain public input regarding one or more aspects of RCRA implementation.

Development of the guidelines on public participation is nearly completed; publication is expected in January 1978.* They will apply to EPA components and to State and local agencies receiving financial assistance under the Act. They require public participation in the decision-making process through various types of meetings, advisory and review groups, and educational programs that would enable the public to become aware of the significance of the technical information upon which decisions hinge.

With the aid of EPA grants, environmental, consumer, civic, and other groups are carrying out public education programs whereby citizens can gain understanding of the issues in RCRA implementation and solid waste management and therefore participate constructively in the decision-making processes. For fiscal year 1977, four such grants totaling $215,000 were awarded.

A wide range of technical and general information materials were produced and distributed during the year (see Appendix for list of publications).

Over 900 literature searches were conducted by the computerized Solid Waste Information Retrieval System (SWIRS), a service available to the public. Abstracts of articles and documents from the world's literature on solid waste management are continually added to the data bank; about 5,800 abstracts were added during the fiscal year. The SWIRS library containing the abstracted documents is available to the public through the interlibrary loan system.

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*Published January 12, 1978, *Federal Register*, 43:1902.

In fiscal year 1978, implementation of the public participation guidelines will be a major effort. As the emphasis shifts from development of regulations and guidelines to implementation in the States, the level of public participation and the need for educational programs and materials will increase; expanded efforts are planned in all these areas.

Other Activities

Grant Regulations. Regulations containing the procedures and policies by which EPA will award grants to eligible agencies and organizations under Subtitles C, D, G, and H of RCRA were developed and scheduled for publication in interim form in October 1977.[†] The regulations establish the responsibilities within EPA for the approval and awarding of grants and the policies to be followed by the various levels of government in administering funds appropriated under the authorities of RCRA.

Citizen Suit Regulations. Section 7002 of RCRA authorizes the commencement of suits by private citizens to enforce the Act. Regulations outlining the procedures to be followed and prescribing the information to be supplied in order to meet the notification requirements of the provisions were proposed in the *Federal Register* on July 20, 1977 (42:37214), with promulgation scheduled for October 1977.[‡]

BUDGET

In EPA the Office of Solid Waste (OSW) has lead responsibility for the development under RCRA of all regulations and guidelines and establishment of basic policies for technical and financial assistance, public participation, and a number of other programs. The Office of Research and Development (ORD) is responsible for research and development projects, including most of the studies required under Subtitle H. The Office of Enforcement is responsible for the enforcement aspects of the hazardous waste regulatory program. The EPA Regional Offices have main responsibility for working with the States on RCRA implementation and providing technical assistance. Many other parts of EPA have supportive and cooperative roles in RCRA implementation.

The budget for fiscal year 1977 for the Office of Solid Waste had already been determined when RCRA was passed. In order to make funds available to get implementation underway, funds were reprogrammed from other efforts. The total EPA budget for solid waste activities was approximately $17 million for 1977 (see table).

Real increases for RCRA implementation will occur in fiscal year 1978. The expected 1978 budget for EPA's solid waste activities will more than double to approximately $40 million. The most significant increases are for OSW, up $7 million, and for the State and local grant funds, up $11 million. ORD has an increase of $3 million. The Office of Solid Waste will receive an increase of 30 positions.

[†] Published October 20, 1977, *Federal Register*, 42:56050.

[‡] Published October 21, 1977, *Federal Register*, 42:56114.

EPA SOLID WASTE BUDGET ESTIMATES FOR FISCAL YEARS 1977 AND 1978

Office	1977		1978	
	$ (Millions)	Positions	$ (Millions)	Positions
Office of Solid Waste	$ 8.2	107	$14.8	137
Office of Research and Development	4.2	23	7.7	21
Office of Enforcement	0.1	2	1.1	5
Regional Offices	1.8	60	2.2	66
State/local grants	2.9	–	14.3	–
Total	$17.3	192	$40.1	229

RECOMMENDED LEGISLATION

Recommendations for legislation deemed necessary or desirable to assist in solving solid waste problems are to be included in this annual report, according to Section 2005.

EPA is preparing a package of proposed amendments to RCRA. It is expected that they will be sent to Congress shortly for consideration in the 1978 legislative session. Many of the proposed amendments amount to minor corrections and improvements, but some are substantive. Two of the more substantive proposals, to extend funding authorization at least 2 years to assure States of financial assistance in closing open dumps, and to allow for orderly phasing of the open-dump inventory, are discussed as part of Chapter 3.

CONCLUSION

Fiscal year 1977 was devoted largely to the development of guidelines, regulations, and systems—the Federal program machinery prescribed by the Resource Conservation and Recovery Act for attacking the major solid waste problems of the nation. The account of activities thus far shows substantial progress, although delays will occur in meeting a number of the deadlines.

As EPA completes many of its initial tasks in 1978, State and local governments will begin implementing the results of these tasks. This is in fact the most significant level of implementation, and EPA's main focus will soon be on assisting State and local efforts to build solid waste programs that meet RCRA's goals of environmental protection and resource conservation.

Chapter 2

Planning and Development of State and Local Programs

The Resource Conservation and Recovery Act authorizes Federal technical and financial assistance to State, regional, and local authorities for planning and implementation of comprehensive solid waste management programs pursuant to Federal guidelines. Main elements of comprehensive State programs would include regulation of hazardous wastes, environmental controls on land disposal of all solid wastes covered by the Act, resource recovery and conservation measures, and public participation and information activities. This chapter describes EPA activities to implement the overall planning provisions and the technical and financial assistance programs; the following chapters will deal with specific areas of activity of State and local programs.

To encourage planning on a regional basis, RCRA requires issuance of EPA guidelines within 6 months of enactment (i.e., by April 21, 1977) on identification of areas that are appropriate units for such planning (Section 4002 (a)). Within 6 months of the issuance of the guidelines, the Governors, in consultation with local elected officials, are to formally identify regions; within 6 months of that, State and local officials will jointly identify the agencies that will develop and implement the State solid waste management plan, specifying which agencies are responsible for which functions (Section 4006).

EPA is required to issue guidelines by April 1978 on the development and implementation of the State solid waste management plans (Section 4002 (b)). To qualify for Federal financial assistance, the State plans must meet minimum requirements, including identification of the responsibilities of State, regional, and local authorities in implementing the plan, the prohibition of new open dumps, provision for closing or upgrading all existing open dumps, and provisions for other disposal, recovery, and conservation measures necessary to meet the objectives of the Act.

Federal financial assistance to State and local governments for development and implementation of solid waste management plans is authorized for fiscal year 1978 and 1979 under Section 4008. Under Section 3011, financial assistance is authorized for State hazardous waste program development and implementation pursuant to establishing a federally authorized regulatory program.

Authorities for technical assistance in the Act include Section 2003, which requires EPA to provide, upon request, assistance to State and local governments through teams of personnel ("Resource Conservation and Recovery Panels") including Federal, State, or local government employees or contractors.

A complete study of the manpower and training needs of State and local solid waste programs is required under Section 7007, and grants for training projects are authorized.

OBJECTIVES

During fiscal year 1977, EPA objectives with regard to RCRA mandates for planning and development of State, regional, and local solid waste programs were as follows:

- Promulgation of the guidelines for identification of regions and agencies for solid waste management.

- Preparation of guidelines for development and implementation of State solid waste management plans.
- Technical assistance to State and local governments in all areas of solid waste management, and planning for the program of technical assistance panels.
- Preparation of a program of Federal financial support to State, regional, and local governments.

PROGRAMS

Guidelines for Identification of Regions and Agencies

The guidelines for identification of regions and agencies for solid waste management required by Section 4002 were published in interim form on May 16, 1977 (*Federal Register*, 42:24926). Copies of the guidelines in draft had been sent to over 400 State, regional, and local agencies, other Federal agencies, environmental groups, and representatives of industry. In addition, a public meeting on the guidelines was held March 30, 1977, with prior notice in the *Federal Register*. All comments received in these processes were evaluated in preparing the guidelines for publication.

These guidelines provide criteria and procedures for the formal identification of regions by Governors and the joint identification by State and local officials of the agencies that will develop and implement a State solid waste management plan.

The guidelines point out that the identifications should be consistent with the State's goals for prevention of adverse environmental effects from disposal of solid wastes; priorities for attention among waste types; priorities among disposal practices; and the roles of existing agencies. The identification process should cover all waste types, disposal practices, and all technological approaches to waste management (conservation, recovery, incineration, and disposal).

The goal is to establish complete coverage in each State for needed functions in solid waste management. The prime considerations are equitable distribution of resources, judicious use of disposal capacity from a statewide perspective; encouragement of resource recovery and conservation programs wherever they are economic; accumulation of wastes in sufficient quantity to achieve economical management; resolution of transportation and logistical problems; and maximum use of available means of interregional and interstate coordination. The identification processes are intended to build upon ongoing planning and management efforts, particularly those initiated under the Solid Waste Disposal Act prior to the 1976 amendments, and to coordinate with other programs, principally the areawide water quality management planning being conducted under Section 208 of the Federal Water Pollution Control Act.

The EPA Regional Offices, with support from headquarters, are assisting the States and local elected officials to implement these guidelines.

Guidelines for State Plans

Section 4002 (b) of the Act requires EPA to issue guidelines by April 1978 on the development and implementation of State solid waste management plans. A State plan is a statement of the current status of the State solid waste management program, the long-term objectives of the State program, and the strategy and agenda for achieving the objectives. Thus the plan is an evolving, rather than a static, entity.

Sections 4003 and 4005 set forth the minimum requirements that State plans must meet in order to be approved for Federal funding. The plans must:

- Identify agency responsibilities and the distribution of funds to regional and local governments
- Prohibit new open dumps
- Institute compliance schedules for closing or upgrading all existing open dumps
- Provide for regulatory powers needed to implement the State plan
- Remove impediments to local long-term contracts for supplying solid waste to resource recovery facilities
- Provide for resource conservation, recovery, and disposal programs necessary for environmentally sound management

The management of all wastes covered by the Act* will be covered by the State planning guidelines. Hazardous waste will be regulated in accordance with Section 3006, but planning for hazardous waste management will be subject to these guidelines.

Development of the guidelines is now in progress. In addition to extensive consultation with the States, this process will include examination of comments obtained through public meetings, reviews of drafts of the guidelines, and the Advance Notice of Proposed Rulemaking (July 5, 1977, *Federal Register*, 42:34446). Publication of the guidelines in proposed form is scheduled for March 1978, with final guidelines by June.

Technical Assistance

Technical assistance to State and local governments has always been a major part of the Federal solid waste program. The Office of Solid Waste has been responding to thousands of requests for information and advice each year. The assistance provided ranges from advice over the telephone and mailing of literature to team assessments and long-range studies. Demand for such assistance is rising as a result of the impending regulations, guidelines, and open-dump inventory.

The new program of technical assistance panels that are to be made available to State and local governments under Section 2003 will begin operating in January 1978. The program will be managed by the 10 Regional Offices, with headquarters providing support and coordination. At each Regional Office, a division director will be designated as the panel coordinator. He, in turn, will form a panel tailored to the specific needs of the State and local governments in his Region. The following types of personnel will be available to the coordinator:

(1) Technical experts from the Office of Solid Waste

(2) Technical experts from the Regional Office

(3) Contractual support from the consulting community

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*Solid waste is broadly defined in the Act to include waste sludges, liquids, and contained gases; excluded are domestic sewage, irrigation return flows, industrial discharges subject to permits under Section 402 of the Federal Water Pollution Control Act, and certain radioactive wastes covered by the Atomic Energy Act of 1954. Hazardous waste is considered to be a subset of solid waste.

(4) Peer-matching from State and local governments
(Through this mechanism a government official can obtain consultation on a problem from a person in a like unit of government and like position who has successfully solved a similar problem.)

(5) Technical experts from EPA's Research and Development laboratories

(6) Technical experts from other Federal agencies

(7) Consultant support from universities

As requests for technical assistance are received, they will be reviewed by EPA regional staff. Relatively simple tasks will be dealt with immediately, either by letter or phone or by supplying literature. If more extensive assistance is required, a site visit will be scheduled. Following the site visit, the request will be evaluated against selection criteria to determine its priority relative to other requests. Priorities will be heavily influenced by the mandates under the Act (hazardous waste regulation, the open-dump inventory, etc.). The highest priority requests will be scheduled for assistance through a panel team. The team will be composed of those who are best suited to respond to the request and may consist of one person or any combination of persons available for panel service at the time.

In addition to serving on the panels, EPA headquarters staff will: (1) train personnel in technical assistance delivery and maintain quality control; (2) determine from the Regions their needs for new source material and develop same; (3) create and maintain a list of technical experts from all sectors of the economy; and (4) prepare necessary budget and administrative material.

To facilitate the peer-matching type of assistance, EPA awarded grants in 1977 to the National Association of Counties, National League of Cities, National Governors Conference, American Public Works Association, and the International City Management Association to act as coordinators in bringing together persons in similar positions for mutual assistance. A difficult aspect of this program is maintenance of up-to-date lists of officials who have the expertise and time to assist other communities.

Apart from the panels program, a number of technical assistance projects specifically in the areas of hazardous waste management, land disposal, and resource recovery were carried out in the past year; these are described in the following chapters. In addition, the following activities were conducted:

Development of WRAP (for Waste Resources Allocation Program), a new modeling tool for regional solid waste management planning was completed. The model will generate a comprehensive plan covering selection of sites and processes (including resource recovery) and determining links and flows among sources of waste generation, processing, and disposal sites. The plan will be a minimum-cost method of handling all of a region's wastes while meeting environmental, tonnage, and traffic constraints. Thus far, 5 regional and local governments are using the system, several universities are using it for teaching and consulting, and 50 information requests have been received.

The Cost Estimators Handbook on Transfer, Shredding and Landfilling was developed to assist planners and public officials gain insight into what the costs of their operations are and should be.

In collection of solid waste, the primary technical assistance tool being applied is COLMIS (Collection Management Information System), a computerized program whereby local communities can analyze their collection practices as to costs and productivity and then make improvements. Also, a technique for routing collection vehicles to minimize noncollection time and distances has been devised. By proper routing, productivity can be increased and vehicle operating costs decreased.

The frequency and severity of injuries to solid waste workers are among the highest for all occupations. The Office of Solid Waste conducted for 1 year an Injury Reporting and Information System (IRIS) for solid waste. Through IRIS a municipal or private system can find out what its safety problems are and how they compare with those of other systems. Results of the field test indicated the direct cost of each injury exceeds $440, but if the indirect cost of downtime, overtime supervision, court time, insurance rates, etc., are included, the total cost per injury for municipal systems exceeds $2,640. Results of data analysis for 100 cities will be published in 1978.

Financial Assistance

Federal financial assistance to the States for solid waste programs totaled approximately $3 million in fiscal year 1977, the same as in 1976 and 1975.

About $14.3 million will be available for grants to assist State programs under RCRA in fiscal year 1978. Most of this funding will be needed by the States for conducting the inventory of land disposal sites and for development of the comprehensive State plans. Thus, very little money will be passed through to local governments for other implementation activities during fiscal year 1978. Regulations setting forth EPA procedures and policies for awarding grants under RCRA were developed in fiscal year 1977 and published in October 1977.

PROBLEMS

The statutory deadlines for the formal identification of regional boundaries (6 months after issuance of the EPA guidelines) and identification of State and local agencies responsible for developing and implementing the State plan (6 months after the regional identification deadline) under Section 4006 may not be realistic and may therefore discourage rather than ensure a fresh, complete look at solid waste management needs. It is not likely that statewide consensus can be achieved within the deadlines on the often-controversial issue of who is responsible for particular solid waste management services. Moreover such determinations are likely to be affected by the ensuing planning process. Many States are meeting the requirements by making temporary identifications which may be altered after full examination and discussion of the issues. In this and other instances, unless the need for scheduling is kept in proper perspective it can be a detriment to achievement of the main objectives.

The level of Federal financial assistance in 1978 has a number of ramifications, some of which are described in the following chapters on specific program areas.

PLANS FOR FISCAL YEAR 1978

- Development of the guidelines for State plans as required under Section 4002 will be completed; scheduled date is June 1978.

- The identification of regional boundaries and the State, regional, and local agencies responsible for developing and implementing the State solid waste plans should be completed in 1978. Assistance will be provided to State and local governments in completing this task as requested. A master list of this management data will be assembled.
- The program of technical assistance panels will be put into operation in January 1978. Technical assistance activities will be intensified as State activities to implement RCRA provisions increase.
- Following preliminary plans developed in fiscal 1977, a study of manpower and training needs will be conducted (Section 7007).
- Pending availability of funds, a program of grants to assist rural communities (Section 4009) will be developed.

Chapter 3

Land Disposal

The elimination of environmentally unacceptable land disposal is a prime objective of RCRA. The law directs EPA to issue, within 1 year of enactment, criteria for the classification of all land disposal sites as either environmentally acceptable or unacceptable (Section 4004). Within 1 year after promulgation of the criteria an inventory is to be published of all unacceptable sites ("open dumps") identified according to the criteria (Section 4005). Open dumping is prohibited except as covered by an acceptable schedule for compliance under the State plan (Section 4005). Such a schedule must include an enforceable sequence of actions leading to full compliance within a reasonable time (not to exceed 5 years from date of publication of the inventory).

Section 1008 requires EPA to develop and publish suggested guidelines for solid waste management which provide for the protection of public health and the environment. Following publication of the land disposal criteria, such guidelines will be issued on land disposal practices. They will assist the States in their assessment of compliance with the open dump prohibition and specification of remedial measures.

Thus, the criteria define acceptable land disposal; the inventory is a national listing of sites which do not meet the criteria and therefore should be upgraded or closed; and the suggested guidelines describe acceptable operating practices—the means of achieving the performance goals of the criteria. The State plans provide the framework for the regulatory elements to become functional and effective.

The existing data base for the regulatory measures and for technical assistance is extensive but incomplete in many respects. The Office of Research and Development and the Office of Solid Waste are conducting numerous projects aimed at expanding the knowledge base, as authorized under Subtitle H.

OBJECTIVES

During fiscal year 1977, EPA objectives with regard to the land disposal provisions of RCRA were as follows:

- Development of criteria for the classification of land disposal sites.
- Planning for the inventory of open dumps.
- Continued development of overall EPA policy with regard to municipal and industrial sludge management.
- Technical assistance to State and local governments.
- Continued development of the data base for economical and environmentally safe processing and disposal of solid waste, with emphasis on support of the regulatory aspects of land protection.

- Initiation of required studies: solid waste cleanup in Alaska (Section 3), mining wastes (Section 8002 (f)), and sludge management (Section 8002 (g)).

PROGRAMS

Criteria for the Classification of Solid Waste Disposal Facilities

Section 4004 of the Act requires EPA to promulgate regulations to identify which land disposal facilities shall be classified as sanitary landfills and which as open dumps. The Act states that a facility may be classified as a sanitary landfill only if there is no reasonable probability of adverse effects on health or the environment from the disposal of solid waste at such a facility.

The criteria for land disposal sites were drafted by the Office of Solid Waste using the general guidance in the law and in consultation with other Federal agencies, State and local governments, and other interested parties. Copies of the draft criteria were distributed for review in May 1977 to Federal agencies; all State solid waste management agencies; representatives of local governments, environmental, health, public interest groups, and private enterprise; and some 100 technical experts. Comments were also obtained through public meetings and workshops held as part of the public participation program. Data, case studies, operating experiences, and other information from the public were solicited in the Advance Notice of Proposed Rulemaking published on July 5 (*Federal Register*, 42: 34446).

A voluntary Environmental Impact Statement, including economic impact analysis, is being prepared on the expected effects of the criteria.

For hazardous waste disposal, regulations developed under Subtitle C, when promulgated, will supersede the land disposal criteria.

Although the Act calls for promulgation of the criteria by October 1977, due to the extensive discussions and reviews that have been necessary the final version will not be ready until the summer of 1978. Formal proposal in the *Federal Register* is expected in January 1978.

The Inventory of Open Dumps

The inventory of open dumps will necessitate locating, inspecting, and evaluating all land disposal facilities in the country. In addition to the approximately 20,000 disposal sites for general refuse, there are estimated to be 23,000 sludge disposal sites and over 50,000 surface impoundments for industrial wastes. Besides the sheer magnitude of the task, there are other difficult aspects that are discussed below under "Problems." Publication of a complete inventory within 1 year of publication of the land disposal criteria, as required by the Act, does not seem feasible. Plans are being made for phasing the inventory over a longer period to permit adequate evaluation of disposal facilities.

EPA has contracted for the services of the Bureau of the Census to carry out system design and data management. The States will evaluate the individual disposal sites against the criteria with EPA financial and technical assistance. Publication of the inventory will be an EPA responsibility. Evaluation of surface impoundments such as pits, ponds, and lagoons will be coordinated with assessments being conducted by the Office of Water Supply under the Safe Drinking Water Act.

EPA Policy on Sludges

A Residual Sludge Working Group has been formed in EPA, with the Office of Solid Waste as the lead office, to formulate policy on management of municipal and industrial sludges. The group prepared a work plan in September 1976 which is now being implemented. The plan includes: an analysis of all options for the disposal of residual sludges in air, water, and land; development of a public education program for sludge management; and development of a strategy paper for municipal sludge management.

The municipal sludge strategy paper will be made available for public comment in early 1978. It will describe what EPA plans to do in the area of municipal sludge management in light of its legislative mandates and existing Federal, State, and local capabilities and resources. The strategy will serve as a blueprint for future municipal sludge management policy and actions. Public education activities in the area of sludge management are noted in Chapter 6.

Technical Assistance

In addition to the technical assistance activities described in Chapter 2, the following projects were undertaken in the land disposal area:

Manuals. Three manuals are being prepared under contract that will assist in State regulation of land disposal:

- The permitting manual will describe the use of a system of State permits for construction and operation of land disposal sites. The manual will address in detail the aspects included in the land disposal criteria. This will allow State agencies to review plans for proposed land disposal sites using a systematic and uniform method. The manual will incorporate the experience gained from current State permit programs. It is scheduled for publication in early 1978.
- Because the open dump inventory will be conducted largely by the States, there is need for a suggested uniform site inspection procedure. The inspection manual, also scheduled for publication in 1978, will provide the information that State inspectors need to judge the environmental acceptability of current land disposal methods. The manual will address various design and operating techniques which can be used for environmentally sound land disposal. It will also provide discussions and recommendations regarding an effective continuing State inspection program. Issues to be addressed include:

  Frequency of inspections for various types of disposal sites.

  Training requirements for inspectors.

  Costs of inspection procedures.

  Interface of inspection with permit and monitoring procedures.

  Maintenance and utilization of inspection data; follow-up actions for violations.

  Use of visual inspection procedures.

Replicability, or ensuring that the rating scheme produces equitable results, regardless of inspector.

Comparability among State inspection programs so that data collected are applicable to the open dump inventory.

Inspection criteria for the establishment and maintenance of a State inventory of solid waste disposal sites to ensure compliance of State plan with the criteria for sanitary landfills.

- The third manual, completed in 1977, presents effective methods for monitoring groundwater quality near a land disposal facility. While the manual includes the essential steps for developing an effective monitoring program, the approach is general because of the many variables associated with any given site, such as hydrogeologic setting, type of waste being disposed of, ultimate use of the monitoring data, and other factors.

Municipal Sludge Guide. A decision guide on municipal sludge management is in preparation. It will be designed primarily for use by local officials and sewage treatment plant operators, with the focus on sludge management for cities of less than 150,000 population. The guide will discuss aspects of processing sludge for disposal, pretreatment, methods of disposal including landspreading, land reclamation, landfilling, incineration, energy recovery, etc., siting, the potential costs of each processing and disposal method, and their respective advantages and disadvantages. This guide will be completed by September 1978.

Establishing Land Disposal Sites. The siting of land disposal facilities is often blocked by the opposition of people living in the vicinity of the proposed sites. The Office of Solid Waste has been studying the experiences of communities in attempting to establish new sites in order to share the observations with other communities to help them improve their chances for success. An example of successful siting in San Bernardino County, California, was described in a report published in 1977 to serve as one model to consider. The five "keys to success" cited in San Bernardino were: (1) obtain strong support of local elected officials; (2) stress economic and technical considerations; (3) evaluate all reasonable options in a consistent, objective manner; (4) provide examples of well-run landfill operations; and (5) open the site selection process to the public as early as possible.

Research, Studies, Demonstrations*

Special Studies. Work is in progress on several special studies required by RCRA:

- Section 3 of RCRA requires a study of the procedures for removing existing solid waste from Federal lands in Alaska. The study is to examine alternative environmentally safe procedures and the estimated costs for each procedure. A report of the first phase of the study was completed for transmittal to Congress in October 1977. The Alaska Department of Environmental Conservation is assisting EPA in the conduct of this study.

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*Titles of reports resulting from these activities are included in the Appendix.

- Section 8002 (f) requires a study of the adverse effects of mining wastes, alternatives to current disposal methods and their costs, and the potential for using the waste as a secondary source of the mine product. The Office of Research and Development has awarded the contract for this study.
- Section 8002 (g) requires a study of the effects of air and water pollution legislation on sludge generation, amounts of sludge originating in each State, methods of disposal, including costs and effectiveness, alternative methods for sludge utilization, and the reclamation of sludge-damaged areas. The Office of Solid Waste has awarded the contract for this study.

There is a wide range of ongoing studies and demonstrations related to land disposal that are being carried out by the Office of Research and Development and the Office of Solid Waste. Many of them already serve as data sources to support the criteria, guidelines, and other program elements.

Residual Characterization and Decomposition Studies. Data are being collected on composition of municipal and hazardous wastes, and sampling and analytical methods are being developed. Information about waste compatibility, decomposition, and potential for leaching is being obtained.

Pollutant Transport Studies. The release of pollutants in liquid and gaseous forms from various wastes and the subsequent movement and fate of these pollutants in adjacent soils are being studied.

The efforts to evaluate ground-water contamination from land disposal sites were initiated several years ago with studies to determine leachate generation rates. Pilot-scale studies using both processed (shredded and baled) and unprocessed municipal solid waste were initiated, and long-term low-level monitoring of these projects still continues.

Eight municipal sludge disposal sites are currently being studied to determine how far contamination has moved from these sites and whether this contamination represents a significant threat to local ground-water supplies.

Pollutant Control and Treatment Studies. Technology for detecting, minimizing, containing, or eliminating release of pollutants from wastes disposed of on land is being evaluated.

The ability to control ground-water contamination will depend in part on the monitoring techniques available. A number of land disposal sites are currently being monitored to evaluate monitoring methods and to establish standard sampling techniques. The information gained from these studies will augment the monitoring manual described above.

Other pollutant control and treatment studies include:

- Evaluation of natural soil processes for pollutant attenuation.
- The evaluation of liner materials (natural soils, synthetic membranes, and admixtures) used to prevent contaminants from reaching the ground water.
- Development and evaluation of chemical stabilization technology for transforming waste residuals into low-soluble materials to minimize pollutant release and rate of leaching.
- Evaluation of physical, chemical, and biological methods for leachate treatment.

Codisposal Studies. Waste decomposition and pollutant generation associated with admixing or codisposing of various hazardous wastes and/or municipal sludge with municipal refuse are being investigated. Various simulated landfill hydrological conditions with varying hazardous waste loadings are being monitored.

Remedial Action. Studies are in progress directed to the identification and evaluation of best practical technology for minimizing contamination of water and dangerous gas migration from environmentally unsound inoperative waste disposal sites.

Landfill Alternatives. Land disposal alternatives to the common landfill burial techniques are being investigated. These include techniques whereby industrial and municipal wastes are spread and mixed into the soil, disposal in underground mines, and deep-well injection.

Land Application of Municipal Sludge. The studies and demonstrations of the land application of municipal wastewater treatment sludge are focused on effects on health and environment, various methods of application, cost-effectiveness, and public acceptance. The projects in 1977 included the following:

Three university studies are being supported to develop techniques for analysis of metals in sludge and sludge-amended soils.

Two studies, one conducted in Illinois for 10 years and the other in New Jersey for 4 years, have demonstrated some of the effects of long-term use of digested sewage sludge on crop fields, strip mine spoils, and on sandy coastal plain soils. At the Illinois site, a follow-on study was started in 1977 to determine loading rates for various soil-crop combinations following many years of sludge use. A part of the study will also investigate the effect of a one-time application of sludge to a strip-mined area.

Near Denver, a study is in progress to determine the effect of grazing sludge-treated pastures and direct sludge ingestion by cattle. Another study, in Minnesota, includes determining the effects on the composition of the tissues of lambs and the milk from goats that are fed corn silage grown on sludge-treated land.

An EPA grant is the major funding in Houston, Texas, for a 3-year "Landmix" project—the landspreading of sludge with other municipal wastes and the mixing of these with the soil, followed by the raising of agricultural crops. Optimal loading rates in association with crop yields will be determined.

In Bangor, Maine, the composting of municipal sludge is in its third year with EPA demonstration grant support. The process was developed by the U.S. Department of Agriculture and EPA and involves the forced aeration of a mixture of sludge and wood chips to form mulch for use in landscaping. The interim report of this project was published in 1977. An independent assessment is also being made by a sanitary engineering firm to determine the economic and technical feasibility of the process.

An investigation of the market demands for composted sludge has been completed, and the report *User Acceptance of Wastewater Sludge Compost* is in preparation.

A study is underway with the Farm Bureau Development Corporation, Columbus, Ohio, to evaluate social factors and public attitudes that affect the acceptability of sludge use on agricultural land.

Report to Congress on Ground-Water Effects. As required by Section 1442 (a) (4) of the Safe Drinking Water Act (P.L. 93-523), the Office of Water Supply, assisted by the Office of Solid Waste, conducted a major study of the effects on ground water of all forms of waste disposal. The report of the study, *Waste Disposal Practices and Their Effects on Ground Water,* was submitted to Congress in January 1977 and serves as an important data source for the solid waste program.

PROBLEMS

Development of Expertise in New Areas

The wider scope of RCRA, compared with previous solid waste legislation, has had a major impact on the EPA solid waste program. Prior to RCRA, the emphasis was on municipal solid waste and municipal wastewater treatment sludge and the processing and disposal methods typically used for these wastes. With RCRA came increased responsibility for other wastes, such as industrial and mining wastes, and other disposal practices, such as surface impoundments. Some time will be required for EPA and State solid waste management agencies to gain the necessary expertise to be truly responsive in the new areas of responsibility. Because little additional Federal and State staffing, compared to additional workload, has resulted from the passage of RCRA, these areas have not received the attention necessary to conduct meaningful programs in technical assistance, guideline development, and data base generation. Even with regard to land disposal of municipal solid wastes and municipal wastewater treatment sludge, there are many gaps in the available knowledge. Much work remains in researching all these problems and in translating the data into practical guidelines.

The Inventory of Open Dumps

The open-dump inventory, which is required to be published within 1 year of the promulgation of the land disposal criteria, poses several problems:

The inclusion of surface impoundments in the inventory may be a problem because many State solid waste management agencies previously have not had responsibility regarding these facilities. Identifying sites used for municipal solid waste will not be difficult, because most States require permits for these facilities. The present plan is to conduct the inventory process in phases, with the surface impoundments portion published later than the municipal waste sites portion. Phasing would allow OSW and the States some time to become more knowledgeable about assessing the potential impacts from surface impoundments.

Another problem exists in financing the inventory. Since this is a Federal requirement, it is appropriate that the Federal government provide the funding, but the funding level for fiscal year 1978 does not appear to be sufficient for this activity.

A third problem is that the time allotted by RCRA for the inventory is not sufficient for adequate assessment of the effect of sites on ground water. The techniques for ground-water monitoring are not yet well defined and can be basically a trial-and-error procedure in many cases. Also, ground water usually moves laterally at a slow rate, so contamination from a specific disposal site can become apparent many years after the facility is no longer active.

RECOMMENDATIONS FOR LEGISLATION

There are certain changes in RCRA which would facilitate meeting the objectives relating to land protection:

Funding for RCRA currently expires at the end of fiscal year 1979. However, the time-frame for closing open dumps extends to 5 years after publication of the inventory. Therefore, the States will need financial assistance at least 4 years past the current authorization. Extending the RCRA authorizations 2 to 4 years will demonstrate to the States that continuing financial and technical assistance will be available at the time of major State activity in closing open dumps.

For the reasons discussed in the previous section, development of the open-dump inventory must be phased in order to achieve the goals of RCRA. Section 4005 might therefore be amended to allow EPA to publish inventories of sites determined to be open dumps subsequent to the one required within 1 year of the issuance of the criteria. The requirement of compliance within 5 years of publication of the inventory could then be made to refer to the time of publication of the inventory that includes the particular site in question.

These and other amendments, generally of a more technical nature, are being proposed through the usual EPA procedures for such actions.

PLANS FOR FISCAL YEAR 1978

- The criteria for classifying land disposal sites are scheduled for promulgation in the summer of 1978.
- The inventory process will be started when the criteria are promulgated. As discussed above, the Bureau of the Census will be responsible for data management, the States will make inspections and evaluations of the disposal sites, and EPA will provide coordination and assistance and is responsible for publication of the inventory. The available data will be published 1 year after the criteria are promulgated.
- Guidelines for land disposal will be developed following determination of the land disposal criteria.
- A major effort will be directed to development of a data base on industrial disposal facilities and waste management practices. A decision will be made in 1978 as to which industrial waste management practices not covered under Subtitle C will require guidelines.
- The report on phase II of the study of solid waste cleanup in Alaska will be submitted to Congress in April 1978. The studies on sludge and on mining wastes required in Section 8002 will be completed.
- The research and demonstration activities will continue to be directed toward providing the necessary data base for standards, guidelines, and technical assistance.

Chapter 4

Hazardous Waste Management

Subtitle C of RCRA mandates establishment of a regulatory control program which will prevent serious threat to human health and the environment from current practices in managing hazardous wastes. Key provisions are for development of criteria for determining which wastes are hazardous, institution of a manifest system to track wastes from point of generation to point of disposal, and organization of a permit system, based on standards, for hazardous waste treatment, storage, and disposal facilities. Under such controls, each generator will determine whether his waste is hazardous according to the official criteria. If it is, he must either obtain a permit to manage it on his property or ship it to a permitted treatment, storage, or disposal facility. In the latter case, a manifest containing basic information about the waste must accompany the shipment. In either case, all treatment, storage, and disposal operations must meet the minimum standards developed.

The standards and regulations lay the framework for a Federal system to control hazardous wastes. Congress was clear in its intent, however, that the States implement this system as part of their comprehensive solid waste management programs. Section 3006 directs EPA to develop guidelines by which such authority will be granted. EPA must grant authorization to interested States unless it finds that the proposed State program is not equivalent to and consistent with the Federal program. Federal grants to States are authorized for fiscal years 1978 and 1979 to aid the establishment of acceptable hazardous waste programs. In any State that decides not to establish a hazardous waste program meeting Federal standards, EPA will administer regulatory control.

The law directs that the standards, regulations, and guidelines for the hazardous waste program be promulgated within 18 months of enactment, that is, by April 1978. By the end of fiscal year 1977, considerable progress had been made in development of these issuances, as described below; however, it appears that promulgation will be delayed several months past the April deadline. The standards and regulations go into effect 6 months after the date of promulgation.

To be effective, equitable, and practicable, standards and regulations must be based firmly on an extensive data base which can be used to analyze the regulatory alternatives and to support the chosen approach. Similarly, the quality of technical assistance depends on the reliability of the technical and economic data base. Under authority of Subtitle H, the Office of Research and Development and the Office of Solid Waste have continuing programs to develop this data base.

For the hazardous waste management program to be fully implemented, enough permitted facilities for treatment, storage, and disposal must be available to manage the wastes generated. Although the existing service industry typically operates at only 50 percent of capacity, the current total capacity is still far short of projected needs. The need to facilitate—and to avoid discouraging—capacity creation is being taken into consideration in EPA development of regulations and guidelines and provision of technical assistance.

As the title of the Act indicates, promotion of resource conservation and recovery is a major goal. Reducing the generation of hazardous wastes, and finding economic uses for such wastes that are generated, are clearly options to be utilized wherever feasible. The system of regulatory control now in preparation should serve to encourage conservation practices. Waste management costs will generally rise as safer methods and safeguards are required, and this should be an incentive to reduce waste generation. Similarly, higher disposal costs should make resource recovery processes comparatively more economic than in the past.

Regulations will apply to resource recovery processes as well as other "treatment" of hazardous waste, however; EPA is investigating ways to reduce the regulatory burden on resource recovery facilities and to provide other incentives in the course of preparing standards and regulations. Additionally, many of the studies, and research, development, and demonstration activities carried out in data development programs relate directly to the evaluation of hazardous waste resource recovery processes and opportunities.

OBJECTIVES

During fiscal year 1977 the EPA objectives with regard to hazardous waste management were as follows:

- Developing the required standards, regulations, and systems for the regulatory control program.
- Encouraging State implementation of the program and development of the guidelines for State hazardous waste programs.
- Providing technical assistance to States, local governments, industries, and others involved in hazardous waste management.
- Developing the technical and economic data base for the regulatory program and for technical assistance.
- Facilitating expansion of the service industry for hazardous waste treatment, storage, and disposal.
- Promoting resource conservation and recovery.

PROGRAMS

Regulatory Programs

In keeping with Congressional intent, the Agency undertook a public outreach program before taking any positions or making any decisions on hazardous waste issues or regulatory alternatives. By so doing, the Agency hoped to identify all of the alternatives available, raise all major issues, and hear arguments and opinions from various segments of the public.

In addition to dozens of public meetings, an Advance Notice of Proposed Rulemaking (ANPR) was published in the *Federal Register* asking for comments on issues and questions facing the Agency in development of the Subtitle C regulations. Response to both the ANPR and the meetings has been substantial, resulting in better understanding by Agency personnel of the various options and viewpoints.

Six working groups, representing many EPA Offices, were formed to advise the Office of Solid Waste on development of Subtitle C regulations. In a departure from the usual procedure, and in keeping with Congressional intent that States participate, a number of States were invited to participate in working group meetings as ex-officio members. Department of Transportation officials also participate in the working groups dealing with the definition of hazardous waste and the standards for generators and transporters of hazardous waste.

In accordance with standard procedure, each set of regulations will first be published in the *Federal Register* as proposed rules. Comments received during the following 60 days will be assured consideration in preparation of the final regulations (see page 8 for tentative schedules for publication of regulations and guidelines).

Defining a Hazardous Waste. Section 3001 mandates the promulgation of regulations identifying and listing hazardous wastes, that is, wastes subject to the controls developed under Subtitle C. Development of the criteria for identifying the characteristics of hazardous wastes must take into consideration such factors as "... toxicity, persistence, and degradability in nature, potential for accumulation in tissue, and other related factors such as flammability, corrosiveness, and other hazardous characteristics." Hazardous waste, as the term is defined for use in the Act, is a subset of solid waste "which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (A) cause or significantly contribute to an increase in mortality or an increase in seriously irreversible, or incapacitating reversible, illness; or (B) pose a substantial present or potential hazard to human health or the environment when improperly ... managed."

Using these indications and findings of previous studies and investigations, the Agency has tentatively selected a set of criteria for identifying the characteristics of hazardous wastes. These characteristics include flammability, reactivity, corrosiveness, toxicity, genetic change potential, tendency for bioaccumulation, infectiousness, and radioactivity. Each of these areas is being investigated to determine how each should be defined and the means to measure or identify the particular characteristic. In most cases, the latter will be specified in terms of a particular test method and a quantitative measure. For example, flammability may be defined as a flash point of 140°F or lower using a specific test method. Other characteristics, however, present problems in terms of the availability of appropriate quantifiable measures or test techniques; such characteristics include infectiousness, toxicity, genetic change potential, and tendency for bioaccumulation.

Another problem area is determination of the type of listing that will be used. The list may, for example, specify wastes of particular processes or wastes containing particular substances at concentrations above a certain level. The use or incorporation of lists already established for other purposes–air and water pollution control, transportation safety, occupational health and safety, etc., is also being considered.

In addition to the consultation available through the working group, considerable public input is being obtained for the development of Section 3001 regulations. Nine meetings have been held in various Regions with representatives of the production industries, waste management firms, transportation industry, State and local government, public interest groups, academicians, and environmentalists. About 300 people attended these meetings and provided much insight into some of the practical problems involved in hazardous waste management. Also, discussions relative to the development of Section 3001 regulations have been held with numerous individuals and organizations.

Several projects have been initiated through grants and contracts to provide background data and test procedures suitable for Section 3001 regulations. These are summarized as follows:

Toxicant extraction procedure development—development of a procedure which would simulate the leaching action in a landfill.

Candidate toxicant extraction procedures—evaluation and selection of representative techniques from existing procedures.

Toxicant extraction procedure evaluation—comparative evaluation of the candidate procedures, the newly developed technique, and actual landfill leachate, which will lead to the selection of a standard procedure.

Toxicity—compilation of background data and an evaluation of the suitability of empirical tests on substances produced by the procedures described above.

Standard procedure validation—determination of the performance of the selected procedure by commercial facilities and optimizing the reproducibility of test results.

Sampling and analysis techniques—development or compilation of standards or protocols for taking a "standard" sample of a waste and analyzing it.

Hazardous waste criteria risk analysis—evaluation of the potential risk of various options for the several criteria being considered for hazardous waste definition.

Hazardous waste list development—exploration of formats for hazardous waste listings.

These projects coupled with in-house activities will provide the background documentation and rationale for the criteria and listing of hazardous wastes. The publication of the proposed regulations for Section 3001 is scheduled for March 1978; an additional proposed test protocol, for toxic wastes, is scheduled for publication in June 1978.

Standards for Generators of Hazardous Waste. Section 3002 requires EPA to establish standards for generators of hazardous waste for: (1) recordkeeping; (2) labeling containers used for storage, transport, or disposal of hazardous wastes; (3) using appropriate containers; (4) furnishing information on the general chemical composition of the hazardous waste to persons transporting, treating, storing, or disposing of the waste; (5) using a manifest system to assure all hazardous waste is designated to go to a permitted facility; and (6) submitting reports to the Administrator on the quantities of hazardous waste generated during a particular time period and its disposition.

The opinion and advice of numerous individuals representing generators, waste handlers, environmental groups, and State and local governments have been obtained either through public meetings or individual discussions. In addition, since many of the standards affect transportation (labeling, containers, manifests, furnishing information), EPA is coordinating the development of Section 3002 regulations with the Office of Hazardous Materials Operation, Department of Transportation.

Since DOT Hazardous Materials Regulations have been developed for labeling and containerization of hazardous materials, the applicability of those standards to hazardous wastes is being assessed. Another contract study is underway to examine the data needs of generators and waste management facilities, the data-handling requirements of the manifest and reporting systems, and existing shipping documentation used for tracking of shipments of waste or materials.

The proposed generator standards are also scheduled for publication in March 1978.

Standards for Transporters of Hazardous Waste. Section 3003 requires development of standards applicable to transporters of hazardous waste as may be necessary to protect human health and the environment. The standards developed shall include as a minimum (1) recordkeeping concerning the hazardous waste transported, its source, and delivery points; (2) transportation of such wastes only if properly labeled; (3) compliance with the manifest system developed under Section 3002; and (4) transportation of all hazardous wastes only to the waste management facility which the shipper declares on the manifest form to be a facility holding a permit issued in accordance with Section 3005 of the Act.

In addition to these minimum requirements, paragraph (b) states that if any hazardous waste identified or listed is subject to the Hazardous Materials Transportation Act, the standards set by the Administrator shall be consistent with the DOT regulations. Also, the Administrator is authorized to make recommendations to the Secretary of Transportation respecting regulation of hazardous wastes under HMTA.

EPA will develop in conjunction with the Department of Transportation those standards which are discretionary under RCRA (placarding, marking, accident reporting) but mandatory under the Hazardous Materials Transportation Act.

The first step will be to include the criteria and list of hazardous wastes under the hazardous materials regulations. This will then make all the hazardous materials transportation regulations applicable to hazardous wastes. Additional recommendations will be made to DOT concerning labeling, placarding, containerization, and handling of the waste when the problems associated with hazardous waste transport (such as factors contributing to accidents, the handling of spilled materials, management of incompatible wastes, and possible training needs of personnel involved) are defined and more fully understood.

Since February 1977, over 300 individuals and industry groups have been involved in public meetings of Section 3003 standards. The problems of hazardous waste transport have been discussed and possible regulatory solutions developed. In addition to the public meetings, a study is being done to characterize and examine the hazardous waste transportation industry. Through this study, the problems with current regulations or the lack of regulations will be addressed.

Publication of proposed regulations under Section 3003 is scheduled for February 1978.

Regulations for Treatment, Storage, and Disposal. Section 3004 mandates the development of performance standards for owners and operators of hazardous waste treatment, storage, and disposal facilities for the purpose of protecting human health and the environment. The Act states that such standards shall include requirements respecting recordkeeping, reporting, monitoring, design, construction, training, and ownership.

The development effort for these regulations has been organized into 13 in-house projects and 7 support contracts. A background document corresponding to each of these projects and contracts will be generated. The document will identify the basic alternative forms each regulation could take and evaluate advantages and disadvantages. Each document will have a number of reviews and revisions; each draft will be reviewed by the Hazardous Waste Management Division staff, consultants, Section 3004 working group, Regional Office personnel, selected outside reviewers, and other interested parties.

The projects will evaluate:

1. Emission control criteria, including controls for open burning, odors, ambient air, and point source emissions.
2. Emergency alarm and automatic control systems.

3. Managerial issues, including requirements for liability insurance, cash bonding, and other means of ensuring financial responsibility; requirements for contingency planning; and requirements for operator certification.
4. Location criteria and protective requirements for ground and surface waters.
5. Environmental monitoring techniques for treatment, storage, and disposal facilities.
6. Compatibility of wastes during treatment, storage, and disposal.
7. Effectiveness of using cover materials to prevent infiltration, fires, and gaseous emissions.
8. Operating conditions and necessary waste-specific restrictions.
9. Regulatory options for controlling and monitoring noise levels.
10. Regulatory options for restricting and monitoring radiation levels.
11. Regulatory options for restricting the uptake of hazardous-substances by plants as a result of land disposal operations.
12. Regulatory options for the design and operation of a hazardous waste storage facility, including vapor controls for tanks, limits on outside storage, and requirements for separating wastes.
13. Methods for handling and disposal of used drums, cans, or other containers.
14. Options for recordkeeping and reporting on-site monitoring activities and the disposition of wastes received.
15. Options for preventing leakages of hazardous wastes from storage impoundments (ponds and lagoons) to ground and surface waters.
16. Existing Occupational Safety and Health Administration (OSHA) regulations which may impact on the environment or public health.
17. Fire prevention options.
18. Regulatory options for preventing and dealing with explosions and spills.
19. Regulatory options for limiting public access.
20. The need for and options available for operator training programs.

Proposed regulations are scheduled for publication in April 1978.

Permit System Development. Under Section 3005, regulations are to be developed requiring each person owning or operating a facility for the treatment, storage, or disposal of hazardous waste to obtain a permit. The rules will define the administrative and procedural requirements for a permit system that is based on the standards developed under Section 3004. The permit system must provide a mechanism to assure uniform control by States or EPA over hazardous waste management facilities, including maintenance of data for compliance monitoring and enforcement.

During the period of December 1976 through June 1977, 14 public meetings were held across the country to discuss development of the facility permit system. At these meetings, representatives of public interest, environmental, and consumer groups, industry, trade, labor, the financial community, the agricultural sector, the academic community, and State and local governments were brought together to discuss the issues.

The major issues that have been identified in relation to the scope of the permit system (i.e., facilities covered, depth of coverage, extent of control), include: criteria for effectiveness; depth of review of permits; extent of public involvement in the process: tradeoffs between information desired versus data collection cost; and exclusions. There are significant problems also in attempting to deal satisfactorily with competing public, industrial, and waste industry demands, especially with regard to assurance of environmental safety.

Five ongoing State permitting programs have been reviewed in detail, and much valuable information has been obtained.

Publication of proposed rules is scheduled for April 1978.

Notification. Section 3010 requires that all persons generating or transporting hazardous wastes or operating facilities for treatment, storage, or disposal of hazardous wastes notify the EPA Administrator (or State authorities in States having authorized hazardous waste management permit programs under Section 3006) within 90 days of promulgation of the definition of hazardous wastes under Section 3001. Notification must consist of the name and location of the person conducting hazardous waste activities, the type(s) of activities, and a description of the waste handled. No specific action is required of EPA under Section 3010 other than receiving the information, although establishment of a mechanism for receiving and processing the information is implied.

Several routes have been taken in developing a plan for implementing Section 3010. In addition to the usual working group, a special meeting was held with representatives of Federal agencies affected by RCRA to brief them on the requirements of the Act and to solicit comments. Four meetings were held with representatives of industry, environmental groups, labor unions, State and local governments, and other interest groups to discuss Section 3010 issues. Typically, 25 to 50 people attended each of these meetings. The input from these sources has been incorporated into the implementation plan.

The issues raised at these meetings included the question of who should receive the notification. The need for a data management system was also clearly indicated. Both State officials and industry representatives expressed the desire that disruption to existing State hazardous waste programs be minimized, emphasizing the need for a flexible implementation strategy. One recurring comment from various sources was that the 90-day mandated notification period is too short for industries to determine if their wastes are hazardous under the Section 3001 regulations. A number of discussion participants expressed the need to assemble a list of persons potentially affected by Section 3010 so that they can be informed of the notification requirement.

At this juncture, the Agency plans to receive notifications at the EPA Regional Offices, except where States request and are granted authority to handle the notifications. Data management systems for handling notification responses are under development. Identification of the resources required by EPA Regional and State offices to conduct notification activities is underway. A model notification form has been developed, but the use of a mandatory form has been rejected due to the need for flexibility and the legal difficulties associated with a required form. A list of potentially affected persons is being developed. Proposed regulations establishing the notification system are scheduled for publication in February 1978.

Environmental and Economic Impact Assessments. Implementation of Subtitle C has been deemed an action for which preparation of an Environmental Impact Statement would be appropriate, and therefore EPA with contracted assistance is proceeding with assembling information necessary to evaluate the impacts of alternative implementation strategies. The draft EIS document will aid public participation in the decision-making process and also help to identify areas where additional information concerning the protection of public health and environment is needed. The draft EIS will be made available soon after the Subtitle C regulations are proposed.

Economic analysis of the proposed regulations is being conducted as required by Presidential Executive Order Nos. 11821 and 11949 implemented by the Office of Management and Budget Circular No. A-107. There are currently five contract studies to assess the economic impact of Subtitle C. These studies specifically examine: (1) cost of compliance, (2) economic impacts on the organic chemicals industry, (3) economic impacts on the hazardous waste transportation and management industries, and (4) economic impacts on selected industries. The information from these four studies will establish a data base for the fifth study, the comprehensive Economic Impact Analysis.

State Hazardous Waste Programs

Section 3006 of the Act allows the Administrator to authorize States to conduct hazardous waste programs in lieu of EPA. Section 3006(a) directs EPA to "... promulgate guidelines to assist States in the development of State hazardous waste programs." Section 3006(b) allows States to apply for and receive authorization to carry out their own program of hazardous waste management "... in lieu of the Federal program ... and to issue and enforce permits for the storage, treatment, or disposal of hazardous wastes ...." States are to be authorized unless the Administrator "finds that (1) such State program is not equivalent to the Federal program under [Subtitle C], (2) such program is not consistent with the Federal or State programs applicable in other States, or (3) such program does not provide adequate enforcement of compliance ...."

The Act recognizes that few of the States will be prepared to administer and enforce a program as comprehensive as that mandated in Subtitle C by October 1978; consequently, Section 3006(c) provides for an "interim authorization" from October 1978 to October 1980. The only criterion for "interim authorization" is that the proposed State program be "substantially equivalent" to the Federal program, a criterion which EPA interprets as a somewhat lesser degree of program development than "equivalent." The intent of this provision is clearly that as many States as possible be authorized, and that EPA administer and enforce Subtitle C in the fewest possible States. This interpretation should enlarge the group of States which qualify for authorization under Section 3006 and give those States receiving interim authorization a 2-year period in which to prepare their programs, with Federal assistance, for full authorization.

The Act requires EPA to promulgate final guidelines for State programs by April 21, 1978. The working group for this effort includes representatives of five States as advisors: California, Illinois, Missouri, South Carolina, and Texas. (Representatives from Maryland and Tennessee have also participated in some of the working group meetings.) To obtain further consultation from the States, EPA convened a series of meetings between March 22, 1977, and April 6, 1977, at which 47 States participated and discussed their perception of what should be in the guidelines. A second series of meetings was held between June 23, 1977, and August 10, 1977, drawing a similarly high percentage of the States, to discuss the initial draft of the guidelines. The current schedule calls for issuance of proposed guidelines in January 1978.

It is not possible to know until 1978 how many States or which States will choose to seek and will receive authorization. The major incentive is the grant support for those States that seek to establish authorized hazardous waste programs, but there are other incentives. The guidelines and requirements being developed allow the States as much flexibility to respond to their unique problems, needs, and circumstances as is consistent with the objectives of the Act. The State will thus have an opportunity to tailor a program to its conditions. EPA implementation, on the other hand, will necessarily be concerned with uniformity in administering and enforcing the Act in all the States for which it retains responsibility. This may lead to a certain dilution in the attention paid to a State's unique concerns. Also, the regulated community within a State may prefer to deal with its own elected representatives and those appointed by their representatives. Each State will weigh these incentives against the knowledge that the Act provides one major disincentive: where the State does not seek, or does not receive, authorization, EPA will administer and enforce the program. In other words, a State could abstain from this program without leaving its citizens unprotected.

A number of States have already begun developing programs which may be sufficient for authorization by 1978. States enacting hazardous waste management legislation in recent years include California, Illinois, Oregon, Maryland, Missouri, Washington, Oklahoma, Minnesota, Kansas, and New Mexico. In 1977 California adopted replacement legislation to bring the State authority in line with RCRA. Texas has actively developed its program for managing the land disposal of hazardous wastes under the legislative authority of its water pollution laws rather than under a State hazardous waste management act. Several other States are now considering hazardous waste legislation, including Iowa and Wisconsin.

EPA is, on balance, optimistic that the States will prefer building their own regulatory program to permitting the Federal government to do the job for them. EPA will support them in this effort as fully as possible, and a vigorous effort is being made to inform the States and the public about the provisions and implications of Section 3006.

Enforcement Activities

Section 3008 of Subtitle C authorizes the Administrator to initiate appropriate enforcement action against any violator of any requirement of the Subtitle. This is the first time Federal enforcement authority has been granted in the solid waste management area.

It is EPA's goal in implementing Subtitle C to ensure that the promulgated regulations are clear and unambiguous, and impose reasonable and enforceable standards of performance. EPA's Office of Enforcement (OE) will assure that the standards, guidelines, and regulations promulgated under RCRA are in concert with the Agency's overall enforcement strategy.

The Office of Enforcement is working closely with the Office of Solid Waste in [illegible] development of Subtitle C standards and regulations. OE will provide administrative support for the issuance of permits, review permit applications for enforceability, and participate in the evaluation of proposed State hazardous waste programs in the area of adequacy of enforcement. In addition, OE is developing policy and procedures regarding the monitoring of hazardous waste management facilities, pursuant to Section 3007, for compliance with Subtitle C regulations. Ultimately, EPA must initiate enforcement actions against facilities which do not comply with the regulatory provisions in those States without an authorized program.

The Office of Enforcement has established the Enforcement Strategy Development Task Force to aid in formulating the regulations, the criteria for compliance monitoring, and the procedures for initiating enforcement actions under the Act. The most formidable job is to establish monitoring criteria which are flexible enough so that States can easily incorporate them into their hazardous waste programs, yet stringent enough to consistently protect health and the environment throughout the nation. The task force will also assist in drafting guidance on inspections and sampling procedures, in establishing enforcement priorities, and in implementing enforcement remedies. The task force will assist in promulgating rules of practice needed to conduct hearings held in pursuant to RCRA and in establishing standards of evidence and criteria for the issuance of notices of violation, compliance orders, and assessment of civil or criminal penalties. A draft analysis of RCRA enforcement provisions and draft interim procedures have been prepared.

Because the Act involves the control of hazardous wastes in all environmental media, OE is assisting in the establishment of cooperative RCRA enforcement agreements with other Federal and State agencies. These agreements will delineate the areas of mutual concern and the protocol for necessary action with regard to hazardous waste management.

OE has organized joint Federal-State seminars on hazardous waste programs. These seminars include training for compliance monitoring and enforcement.

Data Base Development

Data base development for the hazardous waste program takes three major forms. Damage assessment involves analysis of pathways of waste movement through air, land, or waters. Technology assessment evaluates the various waste management alternatives (land disposal, incineration, treatment, etc.) for adequacy in detoxifying the wastes, immobilizing hazardous constituents, or promoting resource recovery. Economic analysis is focused on the costs of improper waste disposal and of proper techniques, thus permitting study of economic tradeoffs and impacts. This work will continue to be carried out through studies, research projects, and full-scale technological and economic evaluations and demonstrations.

The OSW projects completed or in progress in fiscal year 1977 included the following:

- A project being carried out by the Minnesota Pollution Control Agency to demonstrate environmentally acceptable disposal methods at a chemical waste landfill, as well as explore the operational, financial, and public acceptance issues, is now in its third year. The 6-year project is supported by a $3.7 million EPA grant.

  The grantee is currently seeking an appropriate site for the facility. Siting (and associated public acceptance issues) has been a major problem to date..
- A demonstration which matched 7 commercial incinerator types with 13 industrial wastes was completed in December 1976. Very high destruction efficiencies were obtained in rotary kiln, fluidized bed, and liquid injection incinerators, as well as cement manufacturing kilns. The project demonstrated that incineration is a viable alternative for management of organic industrial wastes.
- The methods used to locate sites for land disposal of industrial wastes in both the United States and Europe are being studied. The results of this work will be incorporated into Section 3004 site location regulations.
- A series of five studies has been completed of methods having the potential to recycle, recover, detoxify, or reduce the volume of hazardous wastes. The wastes from four major industry groups were studied to determine the potential for environmentally acceptable treatment. A number of wastes were found to have potential for recovery of valuable resources by using chemical, physical, and biological treatment processes. Further study of these recovery processes seems warranted.
- The ground water beneath 50 industrial waste land disposal sites was sampled; 43 sites were found to have some degree of ground-water contamination traceable to the disposal operation. The findings are being incorporated into background documents in support of regulation of hazardous waste management facilities (Section 3004).

- Assessment studies were conducted of 15 industry groups thought to be generating wastes to a significant degree in the potentially hazardous category. The studies characterized each industry, their wastes, treatment and disposal practices, and costs associated with waste management. The specific industry groups examined were: (1) batteries, (2) inorganic chemicals, (3) petroleum refining, (4) organic chemicals, pesticides, and explosives, (5) pharmaceuticals, (6) paints, (7) primary metals, (8) metals mining, (9) electroplating, (10) leather tanning, (11) special machinery, (12) rubber and plastics, (13) electronic components, (14) textiles, and (15) waste oil re-refining.

  It was determined that approximately 200 million metric tons (wet basis) of industrial waste was disposed of on land by the above industries, excluding metals mining, during 1975. (It should be noted that waste figures for the metals mining industry are approximately four times the quantities from the other 14 categories combined.) It was estimated that approximately 29 million metric tons of potentially hazardous industrial waste was land-disposed by these 14 categories during 1975, i.e., about 14 percent of all land-destined wastes generated by these industries is potentially hazardous. (OSW estimates that approximately 10 percent of all industrial waste is potentially hazardous.)

The Office of Research and Development is carrying out a number of projects, many of which are focused on finding safe means of disposal for unwanted stocks of pesticides.

- Under a grant to the Commonwealth of Virginia, time-temperature relationships research has been conducted to control and dispose of large quantities of Kepone, a highly chlorinated hydrocarbon pesticide. This project has as its main goal the generation of enough valid data so Virginia can build a full-size facility to destroy Kepone. Findings to date show good success in complete destruction (99.99+%) with acceptable air emissions. Kepone has also been successfully coincinerated with sewage sludge in a special rotary kiln and afterburner.
- ORD has contracted with Lockheed Palo Alto Research Laboratory to investigate microwave plasma detoxification of hazardous materials. Primarily concerned with pesticides, this process shows considerable promise for the detoxification of many organic compounds. Currently, the project is in phase II, which includes scale-up to a demonstration-sized reactor of 10-30 lb/hr throughput.
- The University of Dayton Research Institute is performing laboratory research to determine necessary conditions for the thermal decomposition of pesticides. This research is conducted to supply data on incineration of several compounds in use and in large supply.
- TRW, Inc., is under contract to research and develop encapsulation techniques. Generally applied to the pesticides and organic compounds of lower toxicity, this technology is being studied to supply data on material specifications, necessary precautions to prevent leaching, and the corrosive and degrading effects of hazardous wastes on the container.
- Pesticide pit disposal and rinsing water disposal techniques are being investigated by Iowa State University. This research is designed to test overall efficiency of the method, including investigations into environmental impact and the rate of destruction of selected compounds.

- Biodegradation as a processing step for hazardous wastes is being investigated by SCS Engineers. The objective of this project is to determine the technical, practical, and economic feasibility of the process. Techniques being investigated include neutralization, temperature control, biological seeding, and nutrient addition.
- To supply information on air emissions and environmental impact, a contract to sample and monitor air pollution at hazardous waste facilities is to be awarded. This project will evaluate the toxicity of byproducts and the health and environmental hazards associated with a processing plant of this type.
- In an effort to understand the environmental damage already caused, the University of Illinois was contracted to research the fate of 32 of the most widely used pesticides in the soil. This study evaluated the pesticides' residual toxicity in the soil, degradation mechanisms, and forms of control.
- The U.S. Army Edgewood Arsenal is assessing techniques for treating selected hazardous wastes. This study is an overview of all existing treatment processes and the effectiveness of these processes for specific classes of hazardous materials.
- The Midwest Research Institute is under contract to define the state of the art of pesticide disposal. The object is to keep abreast of all current technology and practices for pesticide disposal and prepare a manual on the techniques available.

Technical Assistance

Beginning in 1973, the Hazardous Waste Management Division of the Office of Solid Waste established a program of technical assistance at EPA headquarters and has encouraged and assisted the Regional Offices in establishing similar programs. Requests for technical assistance have been coming from all sectors of our society, including industry, government, academic institutions, and the general public, and from foreign countries, via letter, telephone, and personal visits. The assistance provided ranges from supplying copies of EPA publications to the sending of teams of experts to investigate incidents of improper hazardous waste management practices and to advise on safe practices and remedial measures. During fiscal year 1977, over 400 separate requests for technical assistance were handled by the Division, and approximately five times that number were handled in EPA's 10 Regional Offices. Some examples of major technical assistance activities during this period include:

- Division staff in cooperation with other elements of EPA and the States of Virginia and Maryland investigated, analyzed, and recommended methods and procedures for the proper treatment, storage, or disposal of Kepone and Kepone-contaminated wastes resulting from the Hopewell, Virginia, incident.
- The Division and EPA Region I staff assisted in the packaging, transporting, and disposing of over 250 tons of excess pesticides improperly stored at Hingham Air Force Base, Massachusetts.
- Division staff have been involved in all aspects of the investigations for identifying proper treatment or disposal methods for over 2.3 million gallons of Herbicide Orange in over 41,000 steel drums stored in various locations.

In the course of providing technical assistance, the Division has established a small library of manuals, reference documents, reports of case studies, etc., which is being used extensively not only by EPA staff, but also by State and local governments and industries. To disseminate this information more widely, during the first 9 months of the fiscal year, 10 workshops and conferences were held in different sections of the country for State and local government officials. At these workshops, the contents of the manuals were described in detail, instructions for their use were reviewed, and lines of communication were established for ready exchange of information.

The *State Decision-Makers Guide for Hazardous Waste Management* was completed toward the end of the fiscal year. It reviews issues that have been of concern to existing State programs or that have become prominent since passage of RCRA. Appendix A of the guide is a model State hazardous waste act which was developed with the assistance of many State waste agency managers, the waste management industry, and others.

PROBLEMS

The public meetings and discussions carried out as part of the early regulatory development activities identified a large number of issues and problems, most of which have been resolved. The following is a prioritized list of major problems still remaining.

Resources for Implementation

It is estimated that 20,000 permits will be issued to facilities for the treatment, storage, or disposal of hazardous wastes. Some 300,000 generators, transporters, treaters, storers, and disposers must respond to the notification system. Inspection, sampling, analysis, enforcement, and manifest systems are required. The data management and administrative machinery must be set up to handle all of this. The program will either be carried out voluntarily by the States or it must be instituted by the EPA Regional Offices. The cost to implement the program is expected to be upwards of $20 million per year.

The strongest incentive for the States to seek authorization is availability of the program grants under Section 3011. EPA's estimate is that between one-half to two-thirds of the States will seek authorization if the program is funded at the 85 percent level. Such funding would total $10-$14 million. It is not clear whether Section 3011 funding levels will approach these figures.

Assuming the above estimates of State implementation are correct, over 100 people would be required in the Regional Offices to implement the Act in those States without authorized programs. It is unclear whether this level of manpower will be available. Without it, implementation of the hazardous waste regulatory provisions may be stretched over a much longer period than the 2 years deemed to be reasonable.

Insufficient Capacity and Public Opposition

The hazardous waste management service industry currently has a capacity of about 6 million metric tons per year. In addition, generators of waste have unknown capacity for disposal on their premises. The total quantity of hazardous wastes is estimated at around 34 million metric tons per year. Thus it will be necessary to greatly expand the existing capacity to meet the expected demand.

The potential impact of RCRA on this capacity is unclear. On the one hand, the permit system will close off the low-cost open-dump option and create a greater demand for the services of the existing facilities. Also, since the cheap unacceptable disposal alternatives will be eliminated, the permitted facilities should be able to charge a fee more commensurate with the value of the service rendered. Improved profitability should improve capital availability, leading to expansion. How quickly this will occur is open to speculation.

On the other hand, the publicity surrounding some of the recent cases of improper disposal has understandably stimulated local opposition to the siting of new facilities even when they are acceptable operations. Reports from States with advanced hazardous waste management facility permitting systems indicate increasing difficulty in permitting new facilities due to local opposition. The opposition is often an emotional reaction but becomes effective through denial of zoning or construction permits or through pressure on State officials to deny an operating permit. Active and visible public participation, based on intensive public education efforts, in the development of hazardous waste programs at State and local levels should help to build positive public attitudes. Whether these necessary measures will reduce opposition enough to permit well-justified sitings in the near future is uncertain, however.

Certain wastes (such as dioxin) pose special handling and disposal problems because of extreme toxicity or explosivity. Some of these problems are technical in nature, but many are generated as a result of mistaken public perceptions about the adequacy of safeguards. Heavy local public pressure can build up against disposing of the wastes or even moving it. The net result often involves building costly disposal facilities on site, even though adequate facilities exist elsewhere.

Because of these difficulties, it is tempting for owners of these wastes to dispose of them secretly. Under RCRA such disposal will be illegal, but if the volume and frequency of generation are low enough, it may appear to be worth the risk to the generator. Such actions could pose serious hazards. In addition to more effective public education and participation measures, some legal authority to override local opposition to movement and disposal when suitable facilities exist seems called for.

In summary, the capacity for hazardous waste management services must be greatly expanded, but it is as yet unclear how much expansion there will be to meet the demand created by RCRA requirements because of capital availability and public opposition factors. It is also unclear what effect the Federal government can have on the impediments to capacity creation.

Toxicity Testing

There are little data available on the toxicity of specific wastes. All of the toxicity work which has been done to date relate only to the toxicity of pure substances. Little work has been done on mixtures of substances and essentially none on wastes (which are mixtures of a sort). Our approach to this major problem is to define a test simulating the mechanism by which contaminants from wastes may enter water—and then perform certain tests on the resultant "leachates." The plan includes testing for toxicity, bioaccumulation potential, and genetic change potential. A grant program has been established to evaluate this approach. The goal is the development of a quick, inexpensive "screening" test for toxicity of wastes.

PLANS FOR FISCAL YEAR 1978

Primary attention in fiscal year 1978 will be given to completing the development of the regulations and guidelines (see page 8 for tentative schedule for their issuance).

Drafts of the Environmental Impact Statement and the Economic Impact Analysis will be distributed for public comment within 30 days of publication of all the proposed Subtitle C regulations; final versions will be ready at the time the regulations are promulgated.

In addition to the studies and other projects being conducted, as described above, in support of the development of regulations and technical assistance, projects will be undertaken to support implementation of the regulatory program. Current plans for such projects include the following: the development of manuals for hazardous waste transporters, for hazardous waste facility operators, and in permit application processing and evaluation; a series of State hazardous waste management legislative seminars to assist State solid waste management programs in raising the level of awareness of State legislators about hazardous waste management problems; evaluations of the impact of the regulations on the hazardous waste treatment and disposal industry; development of a mechanism to measure the effectiveness of EPA and the States in implementing Subtitle C; information packages for the public on hazardous waste management laws and regulations; and market surveys for waste exchange systems (systems whereby a waste material of one company can be obtained by another that utilizes such material in its processes).

Chapter 5

Resource Recovery and Waste Reduction

All the stated objectives of the Resource Conservation and Recovery Act are subsumed under two basic goals—"to promote the protection of health and the environment and to conserve valuable material and energy resources" (Section 1003). As indicated in Chapter 2, RCRA provisions encourage States to include programs for recovering resources from waste and reducing the generation of waste in their solid waste plans, and resource recovery should be a major focus of the technical assistance panels program. A number of other EPA activities related to resource recovery and waste reduction are mandated or authorized by the Act, however. Mainly they are concerned with measures to explore and develop the nation's options in these areas. Because this is a developing field, some additional background information may be helpful to placing the activities in perspective.

The major potential benefits of resource recovery and waste reduction may be summed up as follows:

- The demand for land disposal space can be substantially reduced, and therefore the problems of land disposal can be reduced. Decreased waste generation can also result in reduced costs of waste collection and litter pickup.
- The energy and materials recoverable from waste represent small but significant portions of U.S. needs for these resources.
- Recycling, that is, manufacturing using recovered materials, generally results in reduced quantities of pollutants and requires less energy compared with manufacturing with virgin materials.
- Reduced waste generation also usually means savings in energy as well as materials and results in a lessening of the environmental impacts from the entire cycle of resource use, from extraction of raw materials through disposal.

It is estimated that about 6 percent of municipal solid waste is being recovered at present, and that the percentage has changed little in recent years. Stronger market demand for recovered materials and improved methods of recovery are needed before major increases in recovery rates can occur.

Most of the approximately 9 million tons of materials recovered is wastepaper, and most recovery is through source separation, the setting aside of recyclable materials at their points of generation. There is currently renewed interest in source separation of newspaper and corrugated containers as a result of the upward trend in wastepaper markets following a period of depressed markets during the 1974-75 recession. The practice of office wastepaper recycling is also increasing; about 500 organizations are now saving and selling their office paper. EPA guidelines on source separation issued in April 1976 mandate the recovery of office wastepaper, newspaper, and corrugated containers from designated Federal facilities.

The aluminum industry has expanded its recycling efforts in the past few years; in 1976, more than 87,000 tons were collected and the companies increased from 15 cents to 17 cents a pound the amount paid for clean scrap.

As yet, the portion of total waste being recovered through mixed-waste processing plants is not significant, but a number of plants are going into operation in the next few years. As of mid-1976, there were 21 operational facilities (many of them pilot or demonstration projects), 10 under construction or in final stages of contract negotiation or procurement, 30-35 in "advanced planning," and 50-60 localities at the early stage of having commissioned feasibility studies. Nearly all the plants in operation or under construction are based on energy recovery, although ferrous metal is also recovered at most facilities. The energy recovery technology used most widely thus far is waterwall combustion to produce steam. Another process, recovery of refuse-derived fuel for use as a supplement to coal in existing boilers, is in early stages of commercial application following a demonstration with EPA grant support in St. Louis. Guidelines requiring Federal facilities to establish and use resource recovery plants wherever feasible were issued by EPA in September 1976, providing official encouragement to ongoing efforts of Federal agencies, particularly the Department of Defense.

The beverage container deposit is the waste reduction measure of greatest national interest at present. In 1976, voters in Maine and Michigan approved deposits for beverage containers, while voters in Massachusetts and Colorado rejected the proposal. (Deposit laws are already in effect in Oregon and Vermont.) EPA promulgated Guidelines for Beverage Containers in September 1976 which make deposit systems mandatory for Federal facilities. The possible impacts of a national deposit law have been analyzed by EPA and other organizations.

These and many other aspects of resource recovery and waste reduction are described in *Resource Recovery and Waste Reduction: Fourth Report to Congress*, which was submitted to Congress and the President by EPA on August 1, 1977. This report was the last in the series prepared as required by Section 205 of the Solid Waste Disposal Act as amended in 1970 (P.L. 91-512).

RCRA Provisions

Principal RCRA provisions supporting resource conservation are the following:

- The greatest benefit to resource recovery is likely to come from the Subtitle D provisions relating to land disposal. The removal of environmentally unacceptable land disposal will eliminate an unrealistically low-cost alternative for waste disposal that has limited the attractiveness of resource recovery. Similarly the regulation of hazardous waste management should encourage reduction and recovery of hazardous wastes.
- Section 4003 on the minimum requirements for approved State plans, besides closing off open dumping, explicitly states that "all solid waste . . . shall be (A) utilized for resource recovery or (B) disposed of in sanitary landfills . . . or otherwise disposed of in an environmentally sound manner." The requirements also include the provision that no local government within the State shall be prohibited from entering into long-term contracts for the supply of solid waste to resource recovery facilities. The provisions encouraging regional planning and requiring identification of responsible agencies should also facilitate planning for resource recovery.
- Advice to State and local governments on implementation of resource recovery projects and programs will be a focus of the technical assistance panels (Section 2003). Recognition of communities' needs for expert and intensive consultation in the complexities of these enterprises was a prime basis for Congressional adoption of Section 2003.

- Section 1008 requires EPA to issue guidelines for solid waste management; this in effect continues the guideline-writing authority under which the beverage container, source separation, and other guidelines in the area of resource conservation have been promulgated.
- Under Subtitle H, EPA has wide authority to conduct and support research, demonstrations, and studies relating to resource recovery and conservation systems. EPA is directed to enter into contracts to evaluate full-scale solid waste facilities, whether or not they are partially funded by EPA.
- Section 8002 (j) establishes the Cabinet-level Resource Conservation Committee, chaired by the EPA Administrator and comprised of the Secretaries of Commerce, Labor, Treasury, and Interior, as well as the Chairman of the Council on Environmental Quality and a representative of the Office of Management and Budget. The Committee is charged with analyzing and reporting recommendations to the President and the Congress on a wide range of incentives and disincentives to foster resource recovery and conservation. This includes analysis of the effect of removing existing subsidies and allowances for virgin materials. It also includes a specific mandate to evaluate the feasibility of solid waste product charges—an excise tax on products that reflects the cost of collection and disposal of the products. The Committee is required to report every 6 months over a 2-year period to the President and the Congress.
- Section 8002 also requires other studies on specific aspects of resource recovery; these relate mainly to types of recovery systems and their compatibility, to recoverability of specific materials (glass, plastics, tires), and to research priorities.
- Section 6002 of the Act requires Federal leadership in procurement of products manufactured from recycled materials. Agencies are instructed to eliminate any bias in specifications against products containing recycled materials and to procure products containing the highest percentage of recycled materials practicable. States, localities, and contractors must also comply with Section 6002 in purchasing with Federal funds. EPA is to write guidelines to aid agencies in complying with this mandate.
- In Subtitle E the Department of Commerce is assigned various duties to promote resource recovery: publish guidelines for the development of specifications for secondary materials, stimulate development of markets for such materials, promote proven resource recovery technology, and provide for the exchange of technical and economic data on resource recovery facilities.

OBJECTIVES

In addition to the activities to assist State and local program development that are described in Chapter 2, the following objectives with regard to resource recovery and waste reduction were pursued by EPA in fiscal year 1977:

- Implementation at Federal facilities of the guidelines for source separation, for beverage container deposits, and for resource recovery facilities.
- Preparation of guidelines for Federal procurement, as required under Section 6002.
- Continued technical assistance, especially to local governments, in planning and implementing resource recovery systems.
- Continued development of knowledge and technology relating to resource recovery and waste reduction through research, demonstrations, and studies.

- Organization of the interagency Resource Conservation Committee, submission of the work plan to Congress, and implementation of the plan.
- Initiation of the studies required by Section 8002 on research priorities in resource recovery; source separation and other small-scale systems; compatibility of source separation with mixed-waste processing systems; and composition of the waste stream.

PROGRAMS

Guidelines

Beverage Containers. The Guidelines for Beverage Containers, issued September 21, 1976, require that a refundable 5-cent deposit be placed on all containers for beer and soft drinks sold at Federal facilities. The deposit is intended to encourage the return of containers for either refilling or recycling.

Compliance will be monitored through a series of reports. EPA will analyze and concur or not with the agencies' decisions regarding implementation and will track implementation progress. The monitoring element also includes prototype test programs. The Department of Defense is testing the guidelines at 10 military bases around the country with encouraging preliminary results. A second test program was successfully conducted during the summer of 1976 at Yosemite National Park.

In July 1977 the National Park Service began implementing the guidelines throughout its system. Generally, other Federal agencies are also cooperating. EPA is providing technical advice to implementing agencies.

Source Separation. The Guidelines for Source Separation for Materials Recovery were promulgated on April 23, 1976. These guidelines mandate the recovery of high-grade paper, newsprint, and corrugated boxes from designated Federal facilities. The high-grade fraction of waste in office buildings ranges from 35 to 75 percent. Recovery of this valuable fiber source from Federal office buildings is expected to result in savings amounting to approximately $7 million per year. Newsprint and corrugated will be recovered primarily from military bases.

Prototype systems are being started in major Federal office buildings in each Federal Region and on selected military bases. Before recovery programs are set up, however, viable markets for the paper must be located. Open bidding procedures are being used to secure buyers. EPA has assisted the General Services Administration in designing a standardized contract to be used by regional sales offices. In addition, EPA staff have briefed GSA staff in each Region on all aspects of the program.

In order to assist decision-makers and staff in the evaluation and implementation of high-grade office paper recovery systems, *Office Paper Recovery: An Implementation Manual* was published. It includes marketing and implementation procedures, employee education materials, and an economic analysis format.

By October 1977, 71 Federal buildings with 80,000 Federal employees were committed to joining the program. It is expected that another 200,000 Federal employees will be under the program by October 1978.

Resource Recovery Facilities. The Guidelines on Resource Recovery Facilities, issued September 21, 1976, require Federal agencies to establish or use resource recovery plants if they have jurisdiction over any property or facility the administration of which involves the agency in disposal of 100 or more tons of solid waste per day. This action is to follow implementation of the beverage container and source separation guidelines. Other Federal facilities in Standard Metropolitan Statistical Areas disposing of 50 tons or more a day are also under this requirement if the total solid waste for Federal agencies in the SMSA is 100 tons or more per day. Federal agencies are encouraged to enter into joint resource recovery ventures among themselves and with nearby communities in order to maximize economies of scale. The guidelines are thus intended to set a Federal example and to stimulate regional planning for resource recovery.

The agencies' reports on their actions to comply with these guidelines are being reviewed. Excessive cost or lack of markets are considered to be valid reasons for nonimplementation. EPA is providing technical assistance to agencies upon request. In December 1976, the lead agency in each SMSA was designated by EPA. Currently it appears that Federal agencies in about 14 SMSA's may have enough tonnage of solid waste to consider establishing a resource recovery facility, and those in 10 to 15 other SMSA's may be readily able to cooperate with nearby cities to establish a plant. The majority of Federal facilities affected by the guidelines are Department of Defense installations.

Federal Procurement. Section 6002 of RCRA, entitled "Federal Procurement," has as its objective the creation of a "demand pull" for secondary materials through the power of government purchasing. All procuring agencies, including the Public Printer, and States, local governments, and contractors using Federal funds must "procure items composed of the highest percentage of recovered materials practicable consistent with maintaining satisfactory levels of competition." Exceptions may be made only when such materials do not meet reasonable performance standards, are only available at an unreasonable price, or are not available within a reasonable period of time. EPA is charged with writing guidelines to assist procuring agencies in complying with Section 6002.

Of primary importance in this effort is securing the cooperation and input of affected agencies. Meetings have been held with the General Services Administration, the Defense Department, the Office of Procurement Policy, the Department of Commerce, and the Public Printer. Representatives of these agencies have agreed to participate in a formal working group which will assist in formulating policy and actual guideline provisions. The advice of industry representatives has been requested; manufacturers in the paper, steel, and construction industries, particularly, have been interested in these guidelines. Public meetings on the guidelines will be held in 1978.

Promulgation of the guidelines is expected by January 1979.

Technical Assistance

While the technical assistance panels program as a whole will not begin until January 1978, panel-type assistance has been provided in resource recovery implementation since early 1977. Thirty communities and States were provided with detailed analysis of procurement options for resource recovery plants, development of negotiating strategy, review of proposals, preparation and review of requests for proposals, and assistance in establishing source separation operations.

Numerous reports and articles were prepared to supply information needed by public officials who are considering resource recovery as an option for their community and to enable them to make sound decisions when implementing recovery systems. Most important of these publications is the *Resource Recovery Plant Implementation Guide Series,* which is directed to municipal officials and has eight parts: Planning and Overview, Technologies, Risks and Contracts, Markets, Accounting Format, Financing, Procurement, and Further Assistance (sources of information).

A 2-day seminar ("Resource Recovery Technology: An Implementation Seminar") was developed and presented in five cities to over 800 people. These discussions of the status of resource recovery technology and issues of implementation were received with great enthusiasm. Additional presentations are scheduled for fiscal year 1978.

Research, Demonstrations, Studies

The Office of Solid Waste and the Office of Research and Development have a number of projects to develop the data base and technology for resource recovery.

Required Studies. Section 8002 requires several studies relating to resource recovery. The studies of the composition of the waste stream, priorities in research, small-scale and low-technology systems, and compatibility of source separation with high-technology systems were contracted for in fiscal year 1977. The Office of Research and Development is the lead office for these projects, with OSW providing support in reviewing the work scope for each study, reviewing proposals submitted by contractors, and providing reports or recommendations to Congress.

Source Separation. In order to improve and expand the application of source separation techniques to recover a greater fraction of the nation's waste, EPA has funded studies, demonstrations, and implementation grants on a limited scale and has published reports on implementation of source separation at the local level.

Two projects demonstrating multimaterial source separation by households in Marblehead and Somerville, Massachusetts, have been operating for a year and a half. Paper, glass, and cans are collected separately in a compartmentalized truck. Marblehead, which previously operated a separate collection program, is recovering about 25 percent of the total solid waste collected from its 23,000 residents. Somerville, a more densely populated community with no previous experience with recycling, is recovering about 8 percent of total solid waste collected from its 90,000 residents. Marblehead is realizing net savings from the program. The future of the Somerville program is in some doubt at this time because of labor problems and low participation. Source separation programs in several other communities are being financially assisted through small implementation grants.

Technology Demonstrations and Evaluations. EPA has funded demonstrations of several systems of mixed-waste processing for resource recovery.

The technology for producing and burning refuse-derived fuel as a supplement to coal in existing boilers originated with the EPA demonstration project in St. Louis. That project was completed in 1976, and many communities are now implementing systems patterned after it. An extension of the concept is being demonstrated through a grant to the State of Delaware.

The Franklin, Ohio, project, designed mainly to determine the feasibility of wet processing solid waste to recover paper fiber and color-sorted glass, was also completed in 1976. The process appears economically viable for larger plants with nearby users of the fiber. Since markets for the low-quality fiber are limited, however, in future applications of this technology the fiber is likely to be used for fuel. Two large commercial systems of this type are being implemented; both will use the fiber for fuel.

Two systems for recovering energy from solid waste through pyrolysis (decomposition through heating in an oxygen-deficient atmosphere) are being demonstrated in Baltimore, Maryland, and San Diego County, California. Construction is complete on both systems. The Baltimore plant, which produces steam through combustion of pyrolytic gases, has exhibited numerous mechanical problems attributable in large part to the scaling up from pilot plant to large commercial size. The city has continued to modify and operate the plant after the system designer, Monsanto, discontinued its involvement. EPA is evaluating the operation. The San Diego plant is undergoing various testing and startup operations.

A project to demonstrate the recovery of methane from a typical shallow (40-foot deep) sanitary landfill is being supported in Mountain View, California. The success of the testing program has led to development of a full-scale gas recovery project scheduled to go into operation in late 1977. The recovered gas will be upgraded and injected into a nearby utility pipeline.

Federal funding for these demonstration projects totals approximately $25 million.

In addition to the evaluations of our demonstration grant projects, we are conducting detailed technical, economic, and environmental evaluations of other recent commercial-scale resource recovery projects. Evaluations are currently underway of small modular incinerators, the refuse-derived fuel plant in Ames, Iowa, and Chicago, Illinois, and large waterwall combustion units in Europe.

Office of Research and Development. New recovery processes, optimization of existing processes, and new uses for recovered materials are being investigated in projects of the Office of Research and Development:

- As a result of funding from the Interagency Energy/Environment R&D Program in fiscal year 1977, the "Wastes-as-Fuel" program received some much-needed impetus. Some 7 ongoing projects were supplemented and another 15 were initiated with 1977 funds. Of the $4.1 million Wastes-as-Fuel budget, about 44 percent was spent on continuing the development of processes for cofiring waste with coal, 20 percent on development of better pyrolysis processes, 5 percent on new waste bioconversion processes (such as the acid hydrolysis conversion to ethanol process), 11 percent on evaluation of waste preprocessing systems (shredding, air classification, etc.), 7 percent on environmental assessment of waste-to-energy processes, and the remainder on pollution control technologies for wastes-as-fuel processes.

  Illustrative of the projects that were supplemented in 1977 are: (1) continuation of research at the Ames, Iowa, coal-burning powerplant (varying ratios of solid waste to coal were cofired in an effort to characterize technical performance, emission characteristics, and flue gas corrosivity); (2) expansion of the project in which densified refuse-derived fuel (e.g., pellets) is cofired with lump coal in an existing institutional stoker-type boiler; and (3) completion of bench-scale R&D on the concept of utilizing noncatalytic pyrolysis/polymerization techniques to convert solid waste into polymer gasoline.

  Illustrative of the new projects in this area are: (1) the cofiring of municipal solid waste with fossil fuel in an existing industrial boiler; (2) the pyrolysis of agricultural solid waste to easily transportable fuel oil or char by use of a mobile pyrolyzer (a cooperative project with the State of California); and (3) the development of transportable pilot plants to investigate the pollutant removal efficiency versus cost of various control technologies that are applicable to water pollution problems of wastes-as-fuel processes.
- The coprocessing of sludge and solid waste is being investigated in several projects.
- A study to identify, develop, and comparatively evaluate methodologies for estimating the value of several parameters in the design and implementation of a resource recovery facility was performed. Waste composition and quantity were among the parameters studied.

- The development of standard procedures for the sampling and analysis of municipal solid waste and of refuse-derived fuels and other products of a resource recovery plant is an ongoing program. Candidate procedures and methodologies are being investigated, with a complete set of standard procedures as the final objective.
- A study to evaluate performance of a number of trommels, air classifiers, screens, and other equipment for the size reduction and separation of municipal solid waste into its individual components is being conducted. Another study will optimize resource recovery preprocessing systems.
- Costs and benefits of alternative scrap tire management methods, including retreading, energy recovery, landfilling and other methods are being evaluated. Use of rubberized asphalt is being demonstrated to assess the technical and economic performance of various rubber-in-asphalt preparations.
- The use of waste glass mixtures in manufacturing structural clay bricks is being investigated as a market for waste glass. Another objective is to determine the fluxing ability of glass and glass slimes, which if effective substantially reduces energy needed to cure bricks.

The Resource Conservation Committee

Shortly after passage of the Act, the Office of Solid Waste assigned four staff members and reprogrammed $250,000 to initiate the interagency Resource Conservation Committee (Section 8002 (j)). The concepts and specific goals for the Committee were developed, and OSW staff began meeting with representatives from the other member agencies. (In addition to the agencies specified in the law, the Chairman of the Committee invited the Council of Economic Advisors to participate because of the obvious emphasis on economic incentives in Congress' charge to the Committee. In August, the Federal Energy Administration, now the Department of Energy, was also invited to participate.) The first working meeting with representatives from each member agency was held on March 24, 1977, and the first public meeting to present and discuss the work of the Committee was held on April 6. The RCC staff also had several meetings with private industry groups during the spring.

The objectives of the Committee are to (1) study and evaluate selected policies affecting the efficiency with which our society uses materials, (2) inform all major interest groups of these policies and study findings, and (3) present these findings and opinions to Congress in a series of policy reports which express the preferred options and consensus recommendations of the Committee. These policy reports are to be submitted to the President and Congress at 6-month intervals according to the mandated reporting schedule.

The Committee's first report, which was a plan for implementing the Committee's mandate, was submitted to the President and Congress on June 9. The plan was concurred in unanimously by the Committee members. Extensive review comments by numerous public and private interest groups were appended to the report. The list of policies to be examined was presented as follows:

1. Incentives and disincentives for recycling and conservation:

   Charges—particularly the proposal to place solid waste management charges on consumer products

   Subsidies—investment subsidies, operating subsidies

Deposits and bounty mechanisms

2. Effects of modifying existing public policies:

    Percentage depletion allowances for minerals

    Capital gains treatment of timber

    Severance taxes

    Freight rates and regulations

    Government-supported research and development

    Pollution control regulatory programs

    Federal tax treatment of pollution control investments (e.g., pollution control revenue bonds)

3. Product regulation as a conservation tool:

    Recycled material content specifications

    Product durability standards

    Bans on use of hazardous materials

    Product design requirements

    Material rationing schemes

President Carter's Environmental Message was presented on May 23, after the Committee's first report had been completed for printing. In his message, the President highlighted the work of the Committee and stated that:

> I am asking the Committee to accelerate its study and within six months present to me its first recommendations which are to address the use of solid waste disposal charges (levies on materials and products which reflect the costs associated with their ultimate disposal).

The original schedule presented in the implementation plan called for the Committee to present its initial *conclusions* regarding the solid waste disposal charge in the fall of 1977. The President instructed the Committee to accelerate its work so as to make *recommendations* about that time. A report on the disposal charge issue is expected to be completed in early 1978. Another report, regarding Federal legislation on beverage container deposits, will be submitted at about the same time.

Interagency Agreement with Department of Commerce

Cooperative action between EPA and the Department of Commerce is required in implementing several parts of the Act. Moreover, some of the duties assigned to the Secretary of Commerce under Subtitle E are similar to activities which EPA is required to carry out. The advisability of drawing up an interagency agreement on implementation of RCRA was therefore apparent, and such an agreement was drafted in 1977 but has not yet been concluded.

PROBLEMS

Demonstration Program. The resource recovery demonstration grants have enabled cities to accept the risks of trying out new systems at commercial scale. Only through such demonstrations can the actual technical and economic feasibility of systems be known. Both from the successes and problems of the demonstrations a great deal has been learned, and, as indicated earlier, the knowledge is being utilized in many communities. The field is still in an early stage of development, however, and many options remain to be explored. A number of them are now at the stage at which commercial-scale demonstration would be appropriate; for example, use of refuse-derived fuel in cement manufacture, coprocessing of sludge and municipal solid waste for energy recovery, and use of densified refuse-derived fuel. Also much more could be learned about the potentials of multimaterial source separation through additional demonstrations in different settings and using different techniques and equipment. It appears that new demonstrations should therefore be added to the present program in order to take advantage of these opportunities for further progress in resource recovery. At present, however, partly due to the demands of mandated RCRA activities, funds are not available for such projects.

Markets. Markets for recovered materials are very weak compared with those for virgin materials. This is a constant obstacle facing efforts to establish recovery mechanisms. The costs of recovery are frequently unjustified by the revenues obtainable for recovered materials. Appropriate measures are needed to correct market inequities that cause secondary materials to remain undervalued.

Resource Conservation Committee. The Resource Conservation Committee has both high potential and high risks. The Committee is a prime forum for debating and formulating a national materials policy program. Committee recommendations would essentially represent an Administration consensus and, since Congress has had a long-standing interest in this area, the likelihood of important national materials policies being enacted on the basis of the recommendations would be promising. A wide range of interests is represented on the Committee, however, and it is already clear that the meshing of viewpoints and coordination of efforts required to achieve the potentials of the project constitute a formidable challenge.

Technical Assistance Panels. The efforts of the panels program will parallel and support the other Federal and State activities under RCRA. Priority attention will therefore be given to the open-dump inventory, development of State hazardous waste regulatory programs, and State plan development in general. Although it was the need for intensive assistance for local resource recovery systems that originally prompted the idea of establishing technical assistance panels, with the present level of funding and personnel the amount of assistance that can be devoted to resource recovery projects will probably be severely limited.

RECOMMENDATIONS FOR LEGISLATION

National Mandatory Deposits on Beverage Containers. For over 5 years, EPA and others have studied the concept and expected impacts of requiring deposits on beer and soft-drink containers. A uniform national deposit system resulting in the refilling or recycling of containers may offer significant benefits. The Resource Conservation Committee is formulating recommendations to the Congress and the President regarding such a system.

Definition of "Recovered Material." Section 6002 of the Act requires procurement with Federal funds to be of "items composed of the highest percentage of recovered materials practicable." "Recovered material" is defined broadly in Section 1004 as "material which has been collected or recovered from solid waste." In addition to materials which have been used and discarded (post-consumer waste), this definition would include any residual material which may be generated during a manufacturing or resource extraction operation. Some of these residuals are actually byproducts and are already commonly used. Thus the present definition could undermine the objective of Section 6002—to expand materials recovery—by allowing current practices of utilizing readily available, economically retrievable materials to result in de facto compliance with the requirement of the Section.

The definition of recovered materials might therefore be amended to include only materials recovered from converter/fabricator operations and post-consumer waste or are otherwise not currently being used.

PLANS FOR FISCAL YEAR 1978

In addition to the technical assistance and State program development efforts described in Chapter 2, the following EPA activities in resource recovery and waste reduction are planned for fiscal year 1978:

Guidelines. Implementation reports on the beverage container guidelines were due from all Federal agencies by December 1977. EPA is analyzing each of these reports and will concur or not concur with each agency's decision regarding implementation. A notice of availability of non-implementation reports will be published in the *Federal Register*. Technical assistance in implementing the guidelines will continue to be provided. The program for testing the guidelines by the Department of Defense will be completed in 1978.

Work will also continue on the government-wide implementation of the source separation guidelines and the resource recovery facility guidelines. Heavy emphasis will be placed on the preparation of the guidelines on Federal procurement and the monitoring of Federal compliance with Section 6002.

Research, Demonstration, Studies. The required studies on composition of the waste stream, R&D priorities, small-scale systems, and compatibility of source separation and mixed-waste processing will be completed in fiscal year 1978. The required studies on glass and plastics, tires, and resource recovery facilities will be started. The Office of Research and Development will continue its other programs of experimentation and development in resource recovery technology.

New evaluation efforts by OSW will include an examination of the "Torrax" pyrolysis system and certain refuse-derived fuel systems.

The present demonstrations of resource recovery facilities and source separation will continue to be monitored. Case studies of resource recovery implementation will be published, as well as other reports, articles, and guides.

Resource Conservation Committee. The study program of the Resource Conservation Committee will be completed in fiscal year 1978. The final report is scheduled to be submitted to the President and the Congress in October 1978, but slippage into early 1979 appears likely. An interim report is scheduled for the spring of 1978. The Committee will be conducting numerous contract and in-house studies to support these reports. Several public meetings will be held and regular discussions with industry groups are also anticipated. The Committee will hold discussion meetings on roughly a quarterly basis and there will be weekly dialogue between EPA staff and staffs of other member agencies throughout this period.

Chapter 6

Public Participation and Information Activities

In view of the nature and complexity of the issues that RCRA addresses, the voluntary changes in institutional and individual habits and attitudes it is intended to stimulate, and the difficult direct and indirect regulatory actions it prescribes, its successful implementation depends on a high level of public understanding and participation. Fortunately the Act contains an array of public information and participation provisions.

Section 7004 requires that public participation in implementation of all parts of the Act be provided for, encouraged, and assisted by EPA and the States. EPA, in cooperation with the States, is to develop and publish minimum guidelines for such public participation.

Section 8003 requires EPA to develop, collect, evaluate, and coordinate information in key subject areas; rapidly disseminate this information; implement programs to promote citizen understanding; and establish a central reference library on solid waste management.

The Office of Solid Waste for some years has had an active information program directed to both technical and general audiences, a computerized information storage and retrieval system, and, since 1972, a program of grants to organizations (civic, environmental, and consumer groups, labor unions, etc.) to support educational activities. With the passage of RCRA these programs naturally formed the base for implementation of the mandates for information and education programs. They were also considered to be necessary adjuncts to the public participation program, since only informed citizens can participate effectively and constructively in the complex decision-making called for by RCRA.

OBJECTIVES

The objectives for fiscal year 1977 were the following:

- Informing the public of the provisions of RCRA and their implications.
- Providing opportunities for public participation in implementation of the Act.
- Developing the guidelines for public participation.
- Continuing the program to produce and distribute information materials on solid waste management; the citizen education grants program, with orientation toward public participation in RCRA implementation; and the literature search and library services through the Solid Waste Information Retrieval System.

PROGRAMS

Public Participation

The mandated deadlines of RCRA assured that the efforts to implement many of the regulations, guidelines, etc., would have to start immediately. In order for there to be public input in these initial efforts and in early planning for implementation as a whole, public participation activities also had to begin without delay. Public meetings were therefore scheduled, the first being an all-day meeting in Washington on December 16, 1976.

Over 200 persons representing industries, environmental groups, State governments, etc., attended that meeting, which included short presentations by key EPA staff but featured the eliciting of comments, suggestions, and questions from the audience. Similar meetings were held in all the Regions during January through March, 1977.

In the meantime a general plan for public participation was drawn up to guide the program until the formal guidelines were developed. This plan was approved by the EPA Administrator and published in February 1977; its basic features were later incorporated into the guidelines.

A main element of the plan was to hold public meetings, hearings, conferences, and workshops throughout the country on a schedule in accord with major developments in carrying out the key provisions of the Act. Approximately 100 public meetings were held on various sections of the law during the fiscal year. Transcripts of the hearings and meetings were made available to all interested persons.

Guidelines on Public Participation

A draft of the minimum guidelines required under Section 7004 was approved by the EPA working group in June 1977 and sent out to over 300 reviewers covering the spectrum of interest groups and levels of government. A public meeting was held in July to receive comments. A second draft was completed August 26, reviewed, and revised. The guidelines are scheduled for publication in January 1978.*

The guidelines apply not only to EPA but also to State governments and regional and local agencies receiving financial assistance under the Act.

In addition to the pattern of public meetings described above, public participation is described in the guidelines as including: the formation of review groups and ad hoc committees which may meet periodically to review and comment on major programs, regulations, and plans being considered or under development; the development of educational programs so that all levels of the governmental community and the public have the opportunity to become aware of the significance of the technical data and the issues which emerge from it; and the use of all other appropriate established mechanisms to ensure public involvement, such as *Federal Register* notices of proposed rulemaking.

Each agency is required to conduct a continuing program of public information and participation. This program is to include provision of appropriate information to those who are interested in or affected by the decision-making. Each agency is to also provide technical and information assistance to public groups for citizen education activities. The guidelines specify minimum requirements regarding public hearings and other public meetings. Various other requirements are included to assure opportunity for public participation.

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*Published January 12, 1978, *Federal Register*, 43:1902.

Information Programs

To develop public awareness of RCRA and its provisions, to meet the real demand for information about the Act, and to stimulate public participation, EPA developed a variety of materials—summaries, news releases, TV-radio public service announcements, fact sheets, and an exhibit. The printed materials were widely distributed and provided in bulk to OSW grantees carrying out public education programs and to the States and local governments who requested materials for distribution.

As the preceding chapters have indicated, numerous guides and reports are being developed, mainly for use by State and local governments and technical specialists, by Office of Solid Waste personnel and contractors and grantees. These are published through the Government Printing Office or the National Technical Information Service. Articles are also prepared for professional and trade journals. The Office of Research and Development publishes technology transfer reports for public administrators and also issues reports through the National Technical Information Service. (See Appendix for list of publications during fiscal year.)

To make the technical information readily accessible to the interested lay public, pamphlets, films, slide shows, and other materials are developed and distributed. Some of the efforts currently underway and their relationship to RCRA provisions are shown on Charts I-IV. These materials will be made available to State and local governments for use in their public participation and information programs.

In fiscal year 1977, the Solid Waste Information Retrieval System (SWIRS) conducted over 900 literature searches. Users were in government, universities, industry, Congress, etc. The information bank contains over 42,000 abstracts dating from 1964. During fiscal year 1977 approximately 5,800 new abstracts were added. SWIRS also includes a library containing the abstracted documents; these are available through the interlibrary loan system.

Citizen Education Grants

The general purpose of the citizen education grants is to enable programs to be conducted whereby citizens can develop an understanding of the issues in RCRA implementation and solid waste management and therefore participate constructively in local, State, and Federal decision-making. Prior to passage of RCRA, two grants had been awarded for fiscal year 1977. One was to the National Wildlife Federation for conducting education programs on rural solid waste management, with emphasis on environmentally sound land disposal, in Mississippi and Montana. The program in Montana helped that State move toward development of a State solid waste management plan. The Mississippi program is still in progress. The second grant, to the Oil, Chemical and Atomic Workers International Union, supported two workshops on hazardous waste management for the membership.

After passage of RCRA, the Office of Solid Waste augmented the budget for citizen education grants, and two additional programs were selected for funding: To support implementation of RCRA overall, the Environmental Action Foundation will expand its nationwide solid waste communications coalition of citizens and update the coalition leaders on RCRA issues and how to encourage public participation in the local and State programs. The League of Women Voters Education Fund will conduct workshops in five States focusing on State implementation of RCRA provisions with emphasis on hazardous waste regulation. Grants for fiscal year 1977 totaled $215,000.

PLANS FOR FISCAL YEAR 1978

Implementation of the public participation guidelines will be the major new effort in fiscal year 1978. The Office of Solid Waste will work with the public participation officer in each Region to bring about implementation and monitor progress. At the Federal level, approximately 50 hearings and public meetings will be held around the country on the regulations, guidelines, and programs under development.

To assist the State and local governments in their efforts to inform and involve the public, EPA will provide information materials and, as funds allow, grant assistance for educational programs. A total plan has been put together, grouping citizen activities, publications, graphics, and public participation activities to support RCRA's major thrusts through fiscal year 1978 (Charts I-IV).

The citizen activities projects will include the programs of the League of Women Voters Education Fund and the Environmental Action Foundation which were funded in late fiscal 1977. Examples of other projects proposed for funding include: broad public participation programs on all RCRA provisions in certain key States; to help implement Subtitle C, public education programs on hazardous waste disposal, development of a model workshop to orient health professionals on the health-related aspects of solid waste management and RCRA provisions, and conferences of State legislators and key concerned citizens on hazardous waste management and its incorporation into State solid waste programs; and a series of workshops around the country to develop public awareness of the problems of sludge management.

An intensive effort is planned for development of information materials that State and local agencies as well as EPA can use to inform the public on solid waste issues and RCRA implementation.

At the same time the development, publication, and distribution of technical information and the information retrieval and library services will continue.

PUBLIC EDUCATION AND PARTICIPATION PROGRAMS UNDER RCRA:

I. OVERALL IMPLEMENTATION OF RCRA

Underway September 1977 or proposed for fiscal year 1978

Citizen activities	Publications	Graphics	Public participation
Underway	**Underway**	**Underway**	**Underway**
National Wildlife Federation community education projects: Montana, Mississippi Grant to League of Women Voters Education Fund for public education programs related to Federal assistance to States and local governments in hazardous wastes, systems management, resource recovery, and waste reduction Grant to Environmental Action Foundation to expand citizens communications network and update members on techniques to obtain public participation Grant to Center for Environmental Information for broad public participation programs on all RCRA provisions, in nine counties of New York State	RCRA: Required Actions for EPA–Review of SW Plans for FY78, *Waste Age* (several articles) RCRA Highlights–through EPA's Office of Public Awareness Basic pamphlet on overall SWM issues, for use by OSW grantees, States, and for broad distribution Handbook on public participation under RCRA for use by OSW grantees, States, and for broad distribution Public participation guidelines Summary report on first series of regional public participation meetings under RCRA Annual report to Congress and the President on EPA activities under RCRA Citizens handbook	The Lincoln County (Maine) slide show being revised by National Wildlife Federation for EPA's distribution Two television spots on RCRA Five-minute motion picture on RCRA Final exhibit on RCRA, through Office of Public Awareness Slide presentation for States, from source data that will be developed for basic pamphlet on SWM issues Videotape presentation for Regions and States, showing the July 1, 1977, public discussions on public participation draft guidelines Slide presentation for States, based on same source data as used in the public participation and citizens handbooks	Publication of interim guidelines on public participation scheduled for January 1978 Analysis of all Regional public meetings, to evaluate how effectively public participation objectives (as stated in the guidelines) have been carried out during the activities related to implementing each section of RCRA
	Proposed	**Proposed**	**Proposed**
	Periodic appraisals of where we are in RCRA implementation–quickly printed inexpensive reports Summary publication describing grant programs under RCRA	Film or videotape (15 to 20 minutes) on public participation at the community level, related SWM issues under RCRA, through Region I contract	Public discussions of solid waste management guidelines (Section 1008) overall Workshops planned on technical assistance (Section 2003) overall Public discussions planned to evaluate implementation of RCRA

PUBLIC EDUCATION AND PARTICIPATION PROGRAMS UNDER RCRA:
II. IMPLEMENTATION OF SUBTITLE C (HAZARDOUS WASTE MANAGEMENT)
Underway September 1977 or proposed for fiscal year 1978

Citizen activities	Publications	Graphics	Public participation
Underway	Underway	Proposed	Underway
Workshop planned for members of Oil, Chemical, and Atomic Workers International Union, on hazardous wastes	*Hazardous Wastes*, revised edition	Slide presentation for States' public education programs based on *State Decision-Makers Guide for HWM* source data	Public discussions on hazardous waste regulation in October 1977 in Washington, St. Louis, and Scottsdale (Ariz.)
Grants to West Michigan Environmental Action Council and Ohio Environmental Council for conferences of State legislators and key concerned citizens and education programs on hazardous waste management.	*State Decision-Makers Guide for Hazardous Waste Management*	Slide presentation for States based on data used for land disposal publication which includes hazardous waste	Joint public meeting, EPA/U.S. Dept. of Transportation, on transportation regulations for hazardous wastes, October 1977, Chicago
Grant to American Public Health Association to assist health professionals in understanding RCRA by designing a model workshop for 50 affiliates	Model State HW Management Act–Annotated		Public hearings to be held on regulations and guidelines following their publication in proposed form
Grant to Technical Information Project for public education on hazardous waste disposal	Proposed		
Proposed	Land disposal pictorial book depicting practices and problems of disposing of both municipal and hazardous wastes		
Grant for training conference for State officials and key decision makers on hazardous waste issues			
Grant to a large union organization to educate their membership on hazardous waste issues			

PUBLIC EDUCATION AND PARTICIPATION PROGRAMS UNDER RCRA:
III. IMPLEMENTATION OF SUBTITLE D
Underway September 1977 or proposed for fiscal year 1978

Citizen activities	Publications	Graphics	Public participation
Underway	Underway	Underway	Underway
See projects listed on Chart I.	Case study on public acceptance of landfill site, San Bernadino County Overall sludge information brochure Semitechnical interim report on Bangor sludge composting project Land disposal pictorial book depicting practices and problems of disposing of both municipal and hazardous wastes (Chart II)	Sludge film (Office of Research and Development, Office of Public Awareness, and Office of Solid Waste)	Public discussions and hearings scheduled on: Sec 1008, Sludge strategy and guidelines Sec 4002b, State solid waste management guidelines Sec 4004(a), Criteria for sanitary landfills
Proposed	Proposed	Proposed	Proposed
Grant to Izaak Walton League for public education on sludge issues	Popular publication on dumps inventory How Cities Site Landfills (reprint of National League of Cities report)	Slide presentation for States based on data sources used for sludge brochure Slide presentation for States based on data used for land disposal publication (Chart II)	Public discussions on Sec 4005, open dumps inventory

PUBLIC EDUCATION AND PARTICIPATION PROGRAMS UNDER RCRA:
IV. IMPLEMENTATION OF CONSERVATION AND RECOVERY PROVISIONS

Underway September 1977 or proposed for fiscal year 1978

Citizen activities	Publications	Graphics	Public participation
Underway	Underway	Underway	Underway
Education programs for Federal agencies on: office wastepaper recovery, returnable beverage containers	Manual on community public education for separate collection Resource Conservation Committee reports to Congress *Recycling and the Consumer*, revised edition	*Use It Again Sam* bumper sticker and poster Poster for Department of Defense, plus a sticker to be applied to coin-operated beverage dispensers and refrigerators, and other dispensing or sales locations, requesting return of the beverage containers	Public discussions and hearings tentatively scheduled on: Sec 2003, Technical assistance panels Sec 6002, Federal Procurement Guidelines Sec 8002(j), Resource Conservation Committee (public meetings on beverage container and product charge issues)
Proposed	Proposed	Proposed	
Grant to an organization in a State with mandatory deposit legislation to report on successful citizen education programs	Special studies; reports to Congress– (Dec 78): –Composition of waste stream –Research priorities in resource recovery –Source separation and other small-scale resource recovery –Compatibility of source separation with mixed-waste processing (Dec 79): –Glass and plastic waste recovery –Waste tires –Resource recovery facilities Summary reports of demonstrations and evaluations of resource recovery (Sections 8004, 8005, 8006) Manual on office wastepaper recovery	Revised mobile for schools, on *Recycling and the Consumer*	

Chapter 7

Brief Reports from the EPA Regional Offices

The 10 EPA Regional Offices are assisting the Office of Solid Waste in the development of the policies, regulations, guidelines, and programs under RCRA. Moreover the Regional Offices have lead responsibility for working with State and local governments to achieve implementation of RCRA. This includes overseeing the Federal grants, assisting in developing acceptable programs under Subtitles C and D, and serving as the focal point for technical assistance for specific problems related to solid waste disposal and resource conservation systems.

In order to include in the annual report some of the experiences and observations of the Regional staffs, they were asked to contribute brief reports describing notable RCRA-related activities and problems in their respective parts of the country. The resulting body of information, while various in coverage, does serve to add detail and different perspectives to the overall picture of RCRA implementation presented in the previous chapters.

REGION I

(Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont)

The Regional public meetings covering the total Act, held in February in Worcester, Massachusetts, and Concord, New Hampshire, demonstrated substantial public interest in the new law. Over 500 people attended the meetings. Approximately 50 percent of them represented State and local governments, 33 percent came from private industry, and the remainder consisted of private citizens and public interest groups.

Interest in local recycling continues to grow in New England. The response to a recent questionnaire sent to municipal and environmental groups identified approximately 200 municipally sponsored recycling projects in New England. The results of this survey were published by the Regional Office for public distribution.

In July 1977 the John F. Kennedy Federal Building in Boston initiated an office paper recycling program which will serve as a prototype for similar programs at other Federal facilities in the Region.

In New Hampshire there are currently seven rural resource recovery facilities in existence with several more in the proposal stage. These facilities incorporate separation of recyclable material in the home followed by simple processing, i.e., baling of paper, cans, etc., at the recycling facility to facilitate transport and sale at the nearest market. In Maine, the city of Auburn with assistance from EPA is currently implementing a small energy recovery system which will utilize the city's solid waste to produce steam for use by a local industry.

The New England State solid waste management agencies continue to work on the implementation of resource recovery options. The Connecticut Resource Recovery Authority's project in Bridgeport, Connecticut, began construction during December 1976 and is scheduled to begin operation during March 1978. The Rhode Island Solid Waste Management Corporation issued a request for qualifications during January 1977 as a preliminary step to selecting a resource recovery system to service the disposal needs of the greater Providence area. The Massachusetts Bureau of Solid Waste Disposal is currently negotiating a final contract with Universal Oil Products to construct a resource recovery system which will generate electric power for sale to New England Electric. Additional projects are in the planning stages for West Suburban Boston, Worcester, and Springfield, Massachusetts.

The new Federal solid waste law will have significant impact on land disposal practices in New England. It seems likely that the upcoming State inventories will find numerous sites in need of upgrading.

Two States, Rhode Island and Massachusetts, have completed hazardous waste surveys. These surveys will be valuable inputs to the development of comprehensive hazardous waste management programs. In April 1977, Vermont passed comprehensive solid waste management legislation which provides enabling authority to allow the Agency of Environmental Conservation to regulate hazardous wastes from the point of generation to ultimate disposal. The Vermont legislation represents an important step toward assuming authorization for the hazardous waste permit provisions of the new Federal law.

The Regional Office completed a PCB (polychlorinated biphenyl) waste management survey in November 1976 and published a report of the findings. The survey points out a serious problem: there is an absence of environmentally acceptable ultimate land disposal capacity for hazardous waste in New England.

Progress was made in responding to several specific hazardous waste problems in the Region. For example, the Massachusetts Department of Environmental Management with assistance from EPA negotiated a contract with a private company to process and dispose of 200 tons of excess pesticides which were stored at a State park in Hingham, Massachusetts.

REGION II

(New Jersey, New York, Puerto Rico, Virgin Islands)

Regional solid waste management personnel have initiated an office paper separation program at the U.S. Customs House in the World Trade Center. This joint effort between the Regional EPA and General Services Administration staff will serve to demonstrate the feasibility and benefits of such programs for most Federal buildings in the New York City area.

Several major technical assistance projects are underway in the Region. Most are aimed at assisting local governments in the procurement of resource recovery systems. A few projects are being conducted to assist communities in the management and operation of their solid waste collection systems. All of these technical assistance efforts are considered precursors to the "Resource Conservation and Recovery Panels" assistance program mandated by Section 2003 of RCRA.

The Regional office has developed strong relationships with the various State solid waste management organizations in the Region. State representatives have been extremely cooperative and we expect State implementation of Subtitles C and D of RCRA to be very extensive. All but one of the States in the Region has completed or is in the process of conducting hazardous waste surveys. Those States have basic solid waste enabling legislation and rules and regulations applicable to hazardous waste. Some modifications may be necessary but it is too early to be sure of specific areas requiring change. The Section 3006 guidelines will provide the needed measures of performance when they are promulgated. In addition, all of the States in the Region are expected to play an active role in the conduct of the open dump inventory mandated by Section 4005.

While a single public meeting regarding RCRA would have sufficed to meet the minimum requirement of initial public participation, Region II personnel held small "satellite" meetings in Rochester, New York; New Brunswick, New Jersey; and San Juan, Puerto Rico, to complement our main meeting in New York City. These additional meetings enabled us to obtain input from parties who would have been otherwise unable to assist us because of the time and effort required to travel to New York City. In addition, the Regional Office sponsored a specialized public meeting in Buffalo, New York, regarding the Section 3005 hazardous waste facility permit program. Representatives of State and local governments, industrial generators of hazardous waste, operators of hazardous waste treatment and disposal facilities, environmental groups, and members of the general public were in attendance. A specialized meeting was also held in San Juan for Federal facility representatives in the Caribbean area to explain the various EPA guidelines now in effect at Federal installations and to examine the Federal sector's responsibilities under RCRA.

REGION III

(Delaware, Maryland, Pennsylvania, Virginia, West Virginia)

In the hazardous waste area, an EPA grant to Maryland aided the State in developing and passing hazardous waste legislation that is presently being implemented. An offshoot of this endeavor was the State's development of an automated data processing program that can be construed to be the nucleus of a manifest system as mandated in Subtitle C of RCRA.

The Regional solid waste management staff, in concert with the Hazardous Waste Management Division, OSW, held hazardous waste seminars at selected cities throughout the Region, namely, Pittsburgh, Pennsylvania; Fredericksburg, Virginia; Montgomery County, Pennsylvania; and Washington, D.C. The purpose of these seminars was to raise the level of consciousness of first-line supervisors and workers concerning the danger of hazardous materials being shipped for ultimate disposal.

We are working with OSW, ORD, consultants, State and local governments, and other regional professionals in developing environmentally sound options for the disposal of Kepone, Kepone-laden sludges, and other contaminated objects. Within the past several months we investigated a citizen's complaint concerning a chlorine gas emissions problem at a landfill located near Charleston, West Virginia. It was ascertained after visiting the site and consulting with appropriate State officials that no "imminent hazard" existed at the site.

The Regional Office reviews solid waste management grant applications to the Appalachian Regional Commission and evaluates the efficiency of their ongoing projects. The grant recipients are kept abreast of the latest technology and of developments under RCRA. We encourage the utilization of resource recovery principles wherever feasible.

Regional solid waste staff members are also working members and alternates on State executive boards that deal primarily with solid waste management issues, particularly the impact of new Federal legislation on existing State solid waste management laws.

The solid waste staff is presently working with the air and water professionals to look at possible environmental impacts that could occur with construction of a new steel plant that is being proposed and designed by the United States Steel Company. Factors and issues that we have brought to the attention of the company and the contractor developing U.S. Steel's Environmental Impact Statement are: the State agencies that will be involved in regulating the disposal sites; recycling or reuse of the wastes; life expectancy of existing landfills; logistics involved in developing new ones; how hazardous wastes will be handled; and what impact the operation will have on future land use plans of the area.

Numerous meetings were held with our State solid waste management directors to keep them apprised of the progress in the development of guidelines and regulations under the Act. Documents that are sent out to us for review are also sent to the States for their comments when deemed advisable by the author or desk officer for the issuance. Staff members constantly answer inquiries from local officials about the impact of RCRA on their communities.

To insure that all interested parties had an opportunity to discuss their concerns about RCRA, the Regional Office held two public participation meetings, one in Richmond, Virginia, the second in Pittsburgh, Pennsylvania.

To date, the overwhelming concern of our State directors is the funding of RCRA beyond fiscal year 1979. All States have applied for interim funding.

REGION IV

(Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee)

Southeastern Solid Waste Management Training Committee. The State directors in Region IV organized a training committee, composed of the Regional solid waste staff and the eight State directors, with the objective of providing some essential solid waste training for State and local solid waste employees. Training courses will be developed based on the need indicated by the State directors, with at least one course each fiscal year. The first training course was conducted in November 1976 with approximately 50 State and local employees attending. The course was designed for new entry personnel and covered the complete spectrum of general solid waste management. Another course is being developed for the first quarter of fiscal 1978.

Workshop for Federal Agencies. The Regional Office conducted a workshop on April 15, 1977, with the objective of providing guidance relating to RCRA to all Federal agencies in Region IV. As part of the program, the State directors explained the disposal permit requirements for each of the eight States.

Cleanup of Hazardous Wastes in Marion County, Kentucky. An illegal dump site for paint waste and other industrial waste in Marion County, Kentucky, was discovered when a truck hauling paint wastes overturned, spilling the material. The solvents in the waste subsequently percolated through about 18 inches of soil and dissolved a PVC plastic water supply pipe serving that area. When the State of Kentucky discovered the illegal site, it was immediately restricted. EPA was asked to help in cleaning up the site, which contained about 600 barrels of industrial waste. Representatives of Kentucky and EPA made plant visits to the two Cincinnati, Ohio, generators of these particular wastes to enlist their help in cleaning up the site. The generators agreed to take the wastes back and have them disposed of properly if the landowner would take them out of the trenches and load them onto a truck. The hazardous wastes were subsequently removed and the site closed out. Private wells in the area are being monitored as a precautionary measure. EPA provided onsite technical assistance during each phase of the operation.

This incident demonstrated vividly to Kentucky that the State had little control over hazardous wastes. It furthermore served notice on hazardous waste generators in that area that the generator would be ultimately asked to clean up any mess caused by improper disposal of hazardous wastes. The incident strengthened State-EPA relations in hazardous waste control. A legislative package for control of hazardous wastes is soon to be developed. It will be submitted to the Kentucky Legislature, which convenes in January 1978.

Herbicide Orange Disposal. The Regional staff is also working closely with the U.S. Air Force to see that residuals contaminated with Herbicide Orange are stored and disposed safely. The rinsed steel drums are crushed, stored, and covered, awaiting recycling by a steelmill. Other contaminated residuals, such as lumber, rags, etc., are being analyzed for dioxin content and will be buried in a suitable landfill in Mississippi.

Louisville Sludge Contamination. We provided technical assistance to the State of Kentucky for the disposal of Louisville sewage sludge contaminated with hexachlorocyclopentadiene. A list of possible hazardous waste disposal sites was furnished, and it was determined that the contaminated sludge in the digesters could probably be incinerated safely onsite in the existing multiple-hearth incinerators.

Velsicol Dump in Hardeman County, Tennessee. The Velsicol Chemical Corporation is believed to have disposed of approximately 300,000 drums (55-gallon capacity) of liquid and solid residues from the manufacture of certain pesticides at a 300-acre landfill site in Hardeman County, Tennessee, between 1964 and 1972. The site is the largest known pesticide dump in Region IV.

A study by the U.S. Geological Survey in 1966-67 indicated that some of the waste had migrated vertically to a depth of 90 feet and laterally to a distance of 25 feet. Chlorinated hydrocarbon compounds were detected in surface washoff, indicating an overland movement of pesticide waste residues. EPA and the Tennessee Department of Public Health are cooperating with the Geological Survey in further studies to determine the extent and direction of migration of the buried pesticide residues, and the extent of ground-water contamination.

REGION V

(Illinois, Indiana, Ohio, Michigan, Minnesota, Wisconsin)

RCRA Implementation Meetings. A number of meetings were held in Region V to discuss RCRA implementation and to elicit comments from the States and other concerned parties for consideration in the development of regulations and programs. Among the most notable of these meetings were the following: (1) A meeting was held January 25 between Regional staff, headquarters personnel, and representatives of the State solid waste management agencies to discuss implementation of RCRA. The States first met separately to identify their mutual interests and to give priority to those issues which they believed most significant for their individual programs. (2) A public meeting was held in Chicago on March 21 and 22 to discuss RCRA implementation; over 235 persons attended. (3) Regional and headquarters staff made a presentation and received a substantial response from State representatives at a meeting on March 23 at O'Hare Airport. State personnel attending included representatives from Nebraska and Iowa as well as Region V States. The dialogue centered on the draft of the Guidelines for Identification of Regions and Agencies for Solid Waste Management and on issues related to the State hazardous waste programs. (4) At a meeting in Chicago on June 24, Subtitle D issues were discussed by State representatives and EPA Regional and headquarters staff. Modifications were proposed regarding the conduct of the open dump inventory and the preciseness of the land disposal criteria.

Hazardous Wastes. Recent hazardous waste management activities included participation in the Kepone incineration testing in Toledo, Ohio; a presentation to the annual conference of the Wisconsin Liquid Waste Haulers concerning RCRA and its potential impacts; a meeting for the same purpose with the American Petroleum Institute Committee on Refinery Environmental Control, Subcommittee on Solid Waste;

and preparation of guidance for each State in the Region regarding development of their programs. Comprehensive hazardous waste management legislation is being considered in Ohio; the Regional staff has reviewed and commented on the two bills under consideration.

Resource Recovery. At the request of the chairman of the Wisconsin Recycling Authority Board, Region V staff participated in the review of the Authority's request for proposals issued to procure a resource recovery facility and operating contract for Wisconsin's Region I (Outagamie, Winnebago, and Fond du Lac Counties). EPA consultants were also asked to review the RFP. Substantial modifications were recommended and most of them were incorporated. The RFP was issued in May, and proposals are due in September.

As a major technical assistance client, Hennepin County, Minnesota, is proceeding deliberately in its approach to procuring a system. In May, Region V staff met with a county representative to critique the proposed work plan and to underscore the importance of completing certain tasks before making a commitment to issue an RFP. Partially as a result of our recommendation, the county board appointed an energy subcommittee who will guide the county staff in selecting a procurement option, initiate and direct negotiations with the City of Minneapolis for the waste supply, and report to the full Board on the project's progress.

A series of meetings were held among representatives of EPA, the city of Chicago, and Commonwealth Edison to discuss the proposed EPA evaluation of the city's resource recovery plant. Verbal agreement as to the substance of the evaluation was reached. The city is in the process of completing its grant application for approximately $150,000 to offset its cost in providing data and resources for the evaluation.

Region V staff also provided technical assistance for prospective resource recovery projects in Detroit, St. Paul, Brown County (Wisconsin), and Marquette, Michigan.

REGION VI

(Arkansas, Louisiana, New Mexico, Oklahoma, Texas)

Regional planning and hazardous waste control are two prime areas of concern in the Region VI States.

The solid waste management systems in Region VI vary from the sophisticated systems serving a major metropolitan area to the austere arrangements for geographical areas having population densities of less than one person per square mile. Large areas have a low population distribution, making it difficult to manage municipal wastes in an environmentally acceptable manner and remain within the constraints of local government budgeting. Thus, the concept of regional solid waste management is a basic issue in these States.

One example of a regional system in operation is the Arbuckle Solid Waste Trust, created by the Southern Oklahoma Development Association to provide a solid waste management system for Murray and Garvin Counties. The system became operational in August 1973 after an 18-month period of negotiation with each community. The system originated with six compactor trucks serving seven towns in the two counties. All wastes were deposited in a sanitary landfill near Pauls Valley, Oklahoma. Early negotiations for a landfill were especially difficult, but finally the site near Pauls Valley was leased and operations begun. Landfill operations were well-maintained so that negotiations for future sites would be less difficult. In fact, upon completion of the existing site, volunteers were offering land at a minimum lease to the Trust Manager for a new landfill site.

The Arbuckle Solid Waste Trust has survived the energy crisis, the rising spiral of inflation, and numerous renegotiations of local communities' participation in the Trust. It is the only surviving multicounty system in the State and continues to provide environmentally acceptable management of the solid waste of 11 local communities in two counties. Technical and operational assistance was provided by the EPA Regional Office on a scheduled basis for the first 2 years and then on an as-needed basis.

Petrochemical wastes rank high in terms of quantity among the types of industrial hazardous wastes generated within the Region. Environmental problems associated with these and other hazardous wastes have resulted in special action by the States.

The Texas Department of Water Resources has long been interested in the environmentally acceptable management of industrial wastes and industrial hazardous wastes. This interest culminated in the development of a hazardous waste management program which began in 1974 with two part-time employees and has grown to an active program with more than 25 full-time employees in 1977. An EPA grant in 1975 assisted in developing a manifest system, rules and regulations, a pilot control study in the Houston area, and the start of a hazardous waste inventory. The enactment of rules and regulations during January 1976, under existing Water Quality legislation, and establishment of guidelines in July 1976 accelerated the program toward the goal of an effective statewide program. OSW has been assisted by the staff of the Texas Department of Water Resources in developing rules and regulations concerning all areas of hazardous waste management.

In Oklahoma, unsound disposal practices for industrial and hazardous wastes resulted in the enactment of a Controlled Industrial Waste Act in September 1976. Enactment required less than 12 months. Rules and regulations for implementing the Act became effective July 1, 1977, and provide the State Department of Health the necessary authority to regulate controlled industrial waste in the State.

A measure that should prove valuable in the effort under RCRA to assure safe land disposal was undertaken in 1975 when the Texas Department of Health Resources decided to computerize its list of land disposal sites and include the report on each site inspection as a part of the computer program. An EPA grant supported this effort. The system can display the status of any disposal site in the State. In addition, the system can forecast the manpower needs for a surveillance program. This sophisticated management tool is being actively considered by two adjoining States for inclusion in their programs. The three States are investigating the use of this concept in developing an additional system to facilitate the tracking of interstate shipments of hazardous waste.

REGION VII

(Iowa, Kansas, Missouri, Nebraska)

The Regional Office efforts in 1977 included assisting States to develop land disposal strategies in conformity with the requirements of RCRA and to implement the guidelines for identification of regions and agencies. Work programs to conduct the land disposal inventory, upgrade regulations on land disposal, update the State solid waste management plans, develop a hazardous waste management plan, and provide for resource recovery and conservation programs are under development by all four State agencies. The State agencies are also being encouraged to design and implement public participation programs and increase technical assistance to local agencies in implementation of the open dumping ban required under the Act.

In the area of hazardous waste management, the Region VII States were encouraged in 1975 to initiate surveys and program designs. Through bimonthly meetings of the State hazardous waste project directors, a coordinated approach to the problems was achieved. By the end of 1977, all four States will have published the inventory results, three should have program designs and implementation schedules, and two will have comprehensive legislation passed and are working on developing rules and regulations. The Regional Office actively supported the State legislative efforts to meet the requirements of RCRA and worked with the Missouri League of Women Voters to conduct a Hazardous Waste Legislative Seminar in December 1976. In addition, the Regional Office supported the development of the St. Louis Industrial Waste Exchange, the nation's first, and assisted in the presentation of the First National Seminar on Industrial Waste Exchanges in June 1977.

Technical assistance has been provided to Federal agencies and State and local governments in developing paper recycling programs, investigating markets for recovered materials, and planning recovery facilities. Federal facilities are being assisted in implementation of the several EPA guidelines in this area.

A few highlights of State activities follow:

In Iowa, implementation of the sanitary landfill permit program to regulate the processing and disposal of municipal and commercial solid waste is complete. Proposed legislation authorizing an industrial waste survey and hazardous waste controls was introduced in 1975 and 1976, but was not passed. The Iowa Department of Environmental Quality obtained new hazardous waste spill control legislation, which will strengthen the State program.

At the Ames resource recovery plant, the projected quantity of solid waste has not materialized and the operational costs have greatly exceeded the projections. A recent review of the project by Midwest Research Institute recommended over $1 million of work over 2 years to improve the efficiency of the facility.

A joint effort by the Iowa Department of Environmental Quality and the State Office of Planning and Programming resulted in a program which recycled 100,000 junked cars in the last 4 years.

Kansas also requires permits for solid waste processing and disposal facilities, and 98 percent of the State population is served by approved sites. The Kansas Department of Health and Environment obtained passage in 1977 of legislation authorizing a State hazardous waste management program comparable to the Federal program and strengthening the solid waste regulatory program. A survey completed in 1976 of approximately 450 industries identified those with onsite dumping problems, and the Department moved quickly to require industries to dispose of their waste at State-approved facilities.

The Department is attempting to stimulate resource recovery efforts. The University of Kansas is currently assessing the possibility of burning solid waste to produce steam for use by the University. A survey of resource recovery markets was completed in 1976 and will be maintained to aid the local communities in recycling efforts.

In Missouri it was estimated that 85 percent of the population was being served by permitted disposal sites at the end of fiscal year 1976. The Missouri Department of Natural Resources, with the aid of an open committee of nearly 100, secured passage of an excellent hazardous waste management act and is now preparing to implement the program. A survey of 450 industries spurred the development of the St. Louis Industrial Waste Exchange and the development of several new private hazardous waste facilities.

A resource recovery market report and a solid waste collection cost survey was completed, and will be utilized in technical assistance to local communities. The Kansas City metropolitan area with EPA grant support is conducting a comprehensive resource recovery planning study. The Union Electric Company is working with the Bi-State Transportation Authority in attempting to implement a major recovery program in the St. Louis area; technical assistance from the EPA panels program was requested. The city of Columbia passed a bottle bill by referendum and is implementing it.

In Nebraska, the major problems are lack of effective legislation and lack of problem recognition in the State. The existing solid waste permit program has obtained adequate facilities to serve 55 percent of the State's population. Strengthened legislation on solid waste disposal was adopted by the legislature in 1977 but is limited to major cities. The State has completed solid and hazardous waste management and resource recovery strategies to guide future program efforts.

The State is working with cities to promote increased resource recovery. The city of Omaha currently operates a unique system combining a shredder, a high-density baler, and rail haul to a balefill. It can be converted to resource recovery when economics dictate. The city of Chadron also installed a baler and balefill. Sydney, Alliance, and several other Nebraska communities have implemented innovative solid waste collection systems such as rapid pickup systems.

REGION VIII

(Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming)

During fiscal year 1977 the Regional Office awarded grants totaling $538,000 to the States for solid waste management programs. For the purpose of discussing issues relative to the grants, and to discuss problems and developments of each State, Regional meetings of the State program directors were held three times during the year. Also joint meetings were held with Regions IX and X. Each of the meetings also included discussion topics dealing directly with RCRA, i.e., boundary identification guidelines, grant regulations, landfill classification criteria, and authorization of State hazardous waste programs.

In addition to the State grants, the Regional Office awarded a $25,000 grant to Albany County, Wyoming, for development of a countywide solid waste management plan incorporating the major population area of Laramie. The State of Montana recently completed a statewide solid waste management study which was partially funded by $40,000 of Regional energy funds to supplement $200,000 received from the State legislature. The study emphasized the consolidation of the many refuse disposal sites within the State and evaluated the potential for resource recovery. The final report is now being used by the State to develop the Montana State Plan.

In addition to briefings with State officials, the Regional staff has met with and discussed technical as well as political issues relating to RCRA and solid waste with local organizations, the State associations of counties, the State associations of cities and towns, local health departments, regional health directors, the League of Women Voters, and the Sierra Club, as well as individual county, city, and town officials. The Regional Office held general public meetings on the RCRA in Denver and Salt Lake City with good participation in each location. Public RCRA meetings were held in Denver also on various aspects of the hazardous waste regulatory program.

The Regional Office is responding to technical assistance requests from all levels of government. Requests from the Federal government concerning land disposal have come primarily from the Bureau of

Land Management in relation to their leasing of Federal property for landfill utilization. The Department of Defense and many other agencies were assisted with implementation of the resource recovery guidelines. The Federal facilities also received technical assistance in the area of hazardous waste management. The Regional Office is presently implementing a pilot survey of EPA regional laboratories as a precursor to a survey of hazardous waste generated by all Federal agencies in the Denver Metropolitan area. Data from this survey will be utilized by the General Services Administration to develop a collection and disposal contract for hazardous waste materials generated by the agencies in the Denver Metropolitan area.

The Regional Office continues to operate its own high-grade white paper recycling program which is now in its second year. So far, 25 tons of high-grade paper have been collected and sold, all generated by approximately 250 employees in the main office of EPA Region VIII.

The Region VIII States are progressing toward the goal of improving solid waste management. Disposal site inspections and technical assistance are the two major areas of State effort. Several of the States are now operating nonhazardous waste permit programs—Colorado, Montana, North Dakota, South Dakota and Wyoming. South Dakota, North Dakota, Wyoming, and Montana are involved in a training grant through the Old West Regional Commission which will provide training for landfill operators and solid waste administrators for a period of 1 year. Colorado is presently working on regulations for land application of municipal sludge. The Montana State legislature passed three bills giving the State increased authority to license disposal sites, to control hazardous waste management, and to implement resource recovery programs at the local level throughout the State.

The primary obstacle to further improvement of solid waste management within Region VIII is lack of manpower and resources, both in the Regional Office and the States. The major need to achieve better control of land disposal within the States is increased enforcement, which is closely related to availability of resources. RCRA with its prohibition of open dumping should precipitate an increased level of enforcement; however, the procurement of additional resources, either through the State legislatures or increased Federal funding, will be the necessary ingredient to accomplish the level of control necessary.

REGION IX

(Arizona, California, Hawaii, Nevada, Guam)

Early in the year Regional Office representatives visited each State in Region IX to brief key State officials on the Act, EPA's plans for implementation, and implications of the Act for State programs. In addition, a public discussion session was held in March which was attended by approximately 250 people.

The following activities, all funded in part by EPA, are being undertaken in the States and territories:

Arizona. The Department of Health Services declared its intention to seek hazardous waste program authorization under Section 3006 of RCRA and is in the process of developing its program. Hazardous waste regulations have been developed and await legal review and public hearing, pending EPA promulgation of RCRA Subtitle C regulations. In addition, the Department is working to locate and establish one or more hazardous waste processing/disposal sites. To assist the State in this effort, the Regional Office provided both grant and technical assistance and also solicited technical assistance from the Western Federal Regional Council Task Force on Hazardous Materials Management.

California. The California Department of Health has developed one of the most advanced hazardous waste management programs in the nation. The program is currently being further strengthened by new legislation and revised regulations to provide enforcement capability equal to that of RCRA plus an incentive program for resource recovery of hazardous waste. There has been a very valuable exchange of information and technical assistance between the Department and EPA in the development of California's proposed regulations and legislation as well as RCRA Subtitle C regulations. In February the Department, together with EPA, the Western Federal Regional Council Task Force for Hazardous Materials Management, the Ventura County Sanitation District, and others sponsored a national conference on hazardous waste management.

The Department of Health and the California Solid Waste Management Board are meeting on a regular basis at the request of the Regional Office for the purposes of coordinating their RCRA-related activities, such as developing permitting authority, conducting the open dump inventory, and developing and implementing a State plan addressing all solid wastes.

The Board has a strong program that includes the required preparation of county plans in fiscal 1977. The Board conducts significant resource recovery studies and activities, including recycling of office paper in several State office buildings and university campuses. It also has new enforcement authority and has new regulations that provide for the issuance of permits for new and existing solid waste disposal facilities consistent with RCRA requirements.

Nevada. The Division of Environmental Protection is working with several counties in the North Lake Tahoe area to establish a regional solid waste disposal facility. This may provide a basis for developing an interstate region that would include several counties in California.

The Division recently revised its requirements for disposal of hazardous wastes at the Beatty Site to provide improved site monitoring and to place a surcharge on the waste disposed of; the funds will be used for the perpetual maintenance of the site. The Division also developed draft hazardous waste regulations with Regional Office assistance that await public hearing and adoption, pending EPA promulgation of RCRA Subtitle C regulations. In addition, the State formally requested technical assistance from EPA for the purpose of locating one or more additional sites for hazardous waste disposal. The Regional Office sees this request as a possible task for the Resource Conservation and Recovery Panels provided for by RCRA.

Pacific Islands. With EPA demonstration grant support, the Hawaii Department of Health is administering a contract for the development of a strategy for hazardous waste management in Hawaii, the Territories of Guam and American Samoa, and the Trust Territory of the Pacific Islands. The scope of work includes: an inventory including hazardous waste generators and potential disposal sites; the evaluation of present hazardous waste authorities and regulations, and what changes are needed to satisfy RCRA's hazardous waste program requirements; and recommendations on actions to promote resource recovery of hazardous wastes.

REGION X

(Alaska, Idaho, Oregon, Washington)

Disposal Site Inventories. Region X has developed a computer-based disposal site information system to aid the States in maintaining current land disposal site inventories. The system provides for storage, update, and retrieval of information on both active and inactive disposal sites and has been beneficial in assisting the States in managing their permit systems. Region X periodically updates the data base as new data are submitted by the States.

With regard to the open dump inventory mandated by RCRA, the computerized information system already contains much of the necessary data for municipal disposal sites and will be expanded to accommodate new inventory data developed on other types of disposal operations.

Hazardous Waste Management. The majority of Region X States have been active in hazardous waste management for a number of years. With the aid of EPA funding, hazardous waste surveys have been completed in all but one State. Under contract, Region X has also developed a report entitled "An Evaluation of the Status of Hazardous Waste Management in Region X" which further refines and expands upon the State survey data.

Hazardous waste management legislation has been enacted in two of the States in Region X, allowing regulatory control over certain aspects of the hazardous waste disposal cycle. In addition, all four States have the authority to license hazardous waste disposal sites. Currently there are two licensed hazardous waste disposal sites in Region X with a third expected to open within the next year. Waste generated from all parts of the United States are shipped to these sites including some "politically sensitive" waste material. The handling of such controversial waste creates real problems regardless of the technical adequacy of a particular disposal facility. Within the past year a number of such incidents received a considerable amount of press coverage in the Northwest.

Several firms in Region X are active in the processing of hazardous waste for reuse. In addition, a privately sponsored hazardous waste exchange was established through the efforts of the Washington State Department of Ecology. The waste exchange mechanism is based on the concept that "one man's waste may be another man's feedstock."

Resource Recovery. A number of assistance mechanisms aided resource recovery and recycling projects in Region X. Local governments received direct technical support through both State and EPA technical assistance programs. In addition, several financial assistance programs were utilized. Two States passed major bond issues which provide grant and loan support to local governments in implementation of their solid waste management plans. Two counties were successful in national competition under EPA's limited resource recovery implementation grant program. Assistance was also provided through workshops and conferences sponsored by EPA and the States.

Region X is actively working with Federal agencies in implementation of the various mandatory resource recovery guidelines. In February 1977 Region X sponsored the first Solid Waste Management Guidelines for Federal Facilities Workshop where all the requirements were explained to representatives of Federal agencies in the Region. The mandatory beverage container deposit guidelines were successfully implemented at the Whidbey Island Naval Air Station under a Department of Defense test program. The high-grade office paper recycling program was implemented in eight Federal office buildings throughout the Region. Region X is also working with representatives of the larger military installations to aid in establishing joint cooperative resource recovery projects with local governments.

Public Participation. Shortly after the passage of the Resource Conservation and Recovery Act a series of meetings were held to seek public input on implementation of the Act. In addition to the large public meeting held in Seattle in March 1977, more informal meetings were held in each State with local and State officials. As regulation development progressed under the various RCRA mandates, meetings were held with industry, public interest groups, and State and local governments to seek specific guidance on more detailed issues. These meetings will continue as the regulation and guidelines process unfolds.

An extensive mailing list of interested parties was developed and all significant information is routinely mailed as it is published. In addition, a great many specific requests regarding the various RCRA programs are handled daily.

Appendix

EPA Publications on RCRA and Solid Waste Management Fiscal Year 1977

This list is divided into two main parts: Office of Solid Waste publications, and Office of Research and Development publications. Publications with order numbers prefixed by PB are available for purchase from the National Technical Information Service, Springfield, Virginia 22161. All other publications are available from Solid Waste Information, U.S. Environmental Protection Agency, Cincinnati, Ohio 45268. A list of information materials produced since 1966 is available from the Cincinnati address.

OFFICE OF SOLID WASTE

Order Nos.

Resource Conservation and Recovery Act

171 Resource Conservation and Recovery Act of 1976, Public Law 94-580, 94th Congress, S.2150—Oct. 21, 1976 (to provide technical and financial assistance for the development of management plans and facilities for the recovery of energy and other resources from discarded materials and for the safe disposal of discarded materials, and to regulate the management of hazardous waste). [Washington, U.S. Government Printing Office], 1976. 47 p.

563 The Resource Conservation and Recovery Act of 1976; a brief look at Public Law 94-580. [Environmental Protection Publication] SW-563. [Washington], U.S. Environmental Protection Agency, [1977]. 3 p.

564 Public Law 94-580: The Resource Conservation and Recovery Act of 1976; summary of provisions. [Washington, U.S. Environmental Protection Agency, 1976.] 8 p.

565 Solid waste control program expanded. *EPA Journal*, 2(10):4-5, Nov.-Dec. 1976.

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576 Office of Solid Waste. The Resource Conservation and Recovery Act of 1976 (Public Law 94-580); issues for discussion. [Environmental Protection Publication SW-576.] [Washington], U.S. Environmental Protection Agency, Feb. 1977. 10 p.

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592 Office of Solid Waste, *comp.* Transcript; Regional Public Meetings on the Resource Conservation and Recovery Act of 1976, Atlanta, Feb. 23-24, 1977. Environmental Protection Publication SW-15p. [Washington], U.S. Environmental Protection Agency. 107 p., app.

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393 State solid waste management agencies. [Washington], U.S. Environmental Protection Agency, July 1977. 7 p. [List, updated periodically.]

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